BETTER FARMING METHODS

Specialized Magazine for Agricultural CHANGE-AGENTS

MARCH 1961

1954—1959

YEARS O[illegible]. AGRICULTURE

WHY FARMERS PRODUCE TOO MUCH

UNIVERSITY MICROFILMS
313 N 1ST ST
ANN ARBOR MICH

Questions I'm asked about

vitamin **D** *fortification*

Dr. G. C. Wallis, recognized authority in the field of Vitamin D nutrition for livestock

Q: Will two to five pounds of good sun-cured hay provide enough vitamin D for my dairy cows?

A: No. Sun-cured hay varies widely and unpredictably in vitamin D content—80 units to 1,250 units per pound have been reported for sun-cured alfalfa hay. Two to five pounds of lower potency hay would provide about 200 to 500 units per cow per day which is insignificant. Even though the hay happened to be high in vitamin D, there would be only a modest contribution made toward the suggested optimum intake of 6,000 to 8,000 units per pound of dairy ration.

Q: How can I check to make sure my dairy cows are receiving enough vitamin D?

A: Good safeguards can be taken but an absolute check is probably not possible. Optimum vitamin D levels for top performance and longevity have not been clearly established but work is in progress. Mild deficiencies are often difficult or impossible to detect but they can be costly. Available information suggests the use of 6,000 to 8,000 units of vitamin D per pound of complete grain ration. Confidence in your feed manufacturer and the good performance of his well-formulated rations would be important for users of commercial feeds.

Q: Is there any danger of my feeds having too much vitamin D?

A: Our recommendations for the vitamin D fortification of feeds are well within the generally recognized safe limits of vitamin D intake for the different species of animals. With careful methods and efficient modern mixing equipment feed manufacturers are able to achieve good distribution of micro-ingredients. The chance of overdosage is remote.

Q: How much vitamin D do baby pigs and growing-finishing pigs need?

A: Early weaning, fast growth, confinement raising, multiple farrowing and other changes have greatly increased nutritional stress factors since the vitamin D requirements of pigs have been carefully studied. Based largely on amounts that have given good results in experimental and practical swine raising programs, a number of Experiment Stations are suggesting about 500 units of vitamin D per pound of milk replacer and starter with somewhat smaller amounts as pigs approach market weight.

Q: Do sheep get enough vitamin D from natural sources?

A: Not always. For instance, in recent English studies lambs from ewes given supplemental vitamin D averaged 6 pounds heavier at weaning in one flock and 9 pounds heavier in another than lambs from ewes given no vitamin D. Fleeces from experimental animals were more than ¼ pound heavier, graded higher, and brought a premium price.

G. C. Wallis

For more complete answers to any of these questions write to Dr. G. C. Wallis, Director of Nutrition, Agricultural Department, Standard Brands Incorporated, 625 Madison Avenue, New York 22, N. Y.

Fleischmann's Fidy Irradiated Dry Yeast

rich in vitamin D for four-footed animals

another fine product of

Standard Brands Incorporated

These educational advertisements tell farmers about

THE IMPORTANCE OF VITAMIN D FORTIFICATION

Sunshine and sun-cured roughages are undependable sources of essential Vitamin D. Farmers and feeders have many questions about Vitamin D fortification. The advertisement illustrated here (one of a series) shows how Dr. G. C. Wallis, recognized authority on Vitamin D nutrition, answers such questions through FIDY advertising in leading magazines.

It's all part of the educational FIDY program to emphasize that today's added stress factors have changed livestock nutrition requirements. More than ever, farmers must be sure that lack of a dependable Vitamin D source is not a limiting factor in their feed.

Be sure to recommend feeds containing FIDY – Fleischmann's Irradiated Dry Yeast. Here is a rich source of Vitamin D_2 that is dependable—and is economical, easy to use, and truly outstanding in dispersion qualities.

And, if your feeders have questions about Vitamin D nutrition, just have them address –

Dr. G. C. Wallis
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Free technical data and educational aids are also available from the Agricultural Dept. upon request. Write for request form showing available materials.

Fleischmann's F·I·D·Y
IRRADIATED DRY YEAST
RICH IN VITAMIN D FOR FOUR-FOOTED ANIMALS

IH looks ahead!

You'll soon be seeing this giant 4-wheel-drive tractor! Three-hundred horsepower gives it the speed and pull to set new acre-per-day work records. And it's more nimble than much smaller rigs. It steers with all four wheels . . . even "crabs" to farm steep slopes where only a crawler dare follow. Bold new IH ideas promise a bright future for farmers.

Idea factory is an investment in tomorrow's agriculture

Ten acres under one roof . . . all devoted to developing better farm equipment. That's International Harvester's Farm Equipment Research and Engineering Center at Hinsdale, Illinois.

Here nearly 1,500 men . . . engineers, soils experts, chemists, metallurgists, even atomic scientists . . . look ahead to the needs of tomorrow's farmer. These men know farming and farm needs. The most modern laboratories and facilities in the farm equipment industry are at their disposal. Design, development, and testing of farm equipment go on twenty-four hours each day.

Test machines aren't babied . . . they're abused. In an indoor field, planting, tillage, and other tests continue, rain or shine, the year around. On a test track, tractors pull heavy loads at wide-open throttle, day and night.

Field-going laboratories follow new machines far into the countryside where engineers measure, with amazing precision, the actual stresses and strains of rugged field use.

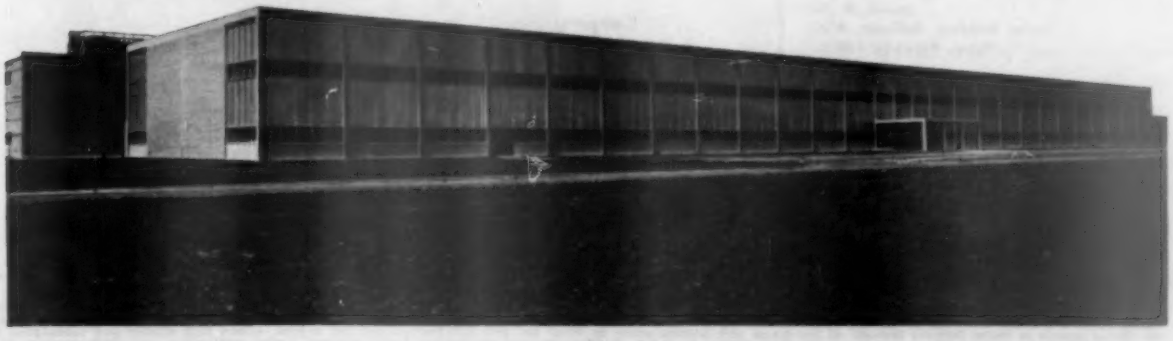
And at the research center, machines twist and jolt implements being tested to duplicate stress and strain of field use. Thus engineers crowd 10 years of normal farm use into as many weeks . . . wear machines out fast to find and eliminate weak points before new designs go to the farmer.

Building farm tractors and equipment best fitted to the farmer's needs has made IH first in farm equipment. And the greatest research and development program in the industry will put tomorrow's IH farm equipment even farther ahead.

World's biggest farm equipment research center puts 10 acres of tomorrow under one roof. Here, design, development, and testing of farm equipment are carried on by skilled teams, using the most up-to-date equipment and instruments.

INTERNATIONAL HARVESTER

World's largest manufacturer of farm equipment



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Phone Murray Hill 3-1492

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H. K. Marcott
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features

1954-1959—YEARS OF CHANGE FOR U. S. AGRICULTURE ..... p. 8

Now it's official — farmers are leaving the land at an unprecedented rate. One in four left in the five-year period 1954-1959. What's more, the 1959 Census of Agriculture shows we have fewer farms than at any time since 1870. The facts about the greatest period of change in history are reported in this special summary of the 1959 Census of Agriculture.

WHY FARMERS PRODUCE TOO MUCH ..... p. 10

Growing two ears where one used to grow is no trick for American farmers who have increased production by one-half since 1940. The big question is: "If our surplus output depresses both farm product prices and farm family income, why do farmers continue to produce too much?"

AGRICULTURE IN AN UNEASY WORLD ..... p. 11

Five former Secretaries of Agriculture, Wallace, Wickard, Anderson, Brannan, and Benson all appeared on the same program at Michigan Farmers Week in early February. These men, representing 28 consecutive years in the Secretary of Agriculture post, told why the Secretary of Agriculture does the things he does and what our policy should be in agriculture during the next decade.

AGRICULTURE IN THE ATOMIC AGE ..... p. 14

If the "atomic age" turns out to be the "giant step" in agriculture we believe it will, many dramatic changes may be expected. First of all, a phenomenally more efficient agriculture appears certain. We can expect farm managment practices to be revamped; credit needs and uses will change; new kinds of facilities will be needed; new skills and techniques will have to be learned; programs of conservation, crop control, subsidy, and tariff will have to be adjusted.

departments

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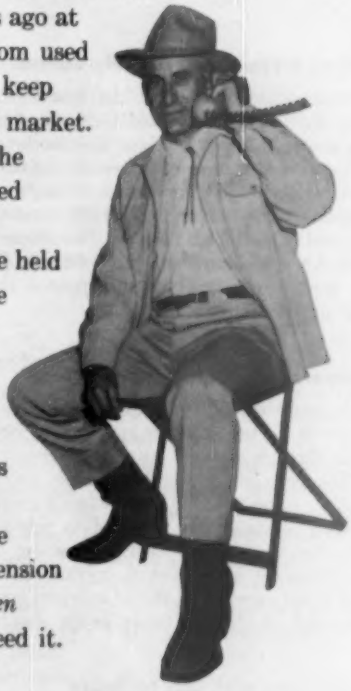
They've found you can run a telephone to a man a lot cheaper than a man can run to a telephone

There's so much a farmer must know, so many people he must look to for services and advice—that the telephone has practically become his life line. Now many farmers are extending the reach of their telephone service with extensions in their outbuildings.

New York Dairyman Saves Two to Three Miles of Walking a Day Until about five years ago, Charles Buckenmeyer handled his 20 to 30 daily calls on the house telephone. He spent a good part of his morning hurrying to and from the house phone—a 200-yard round trip. Now Charlie's extension saves two to three miles of walking daily.

California Farmer Saves 250 Man-hours Arnold Collier has four year-round men to help him run his Dixon, California, farm. He raises grain, alfalfa and produce. Day to day work centers around the machine shed-shop. Arnold figures the extension phone in this building saves him and his men well over 250 man-hours a year. The cost of the extension comes out about 8¢ for every man-hour it saves.

Extension Phone Helps Washington Sheepman Make an Extra $2500 Tom Drumheller has an extension phone in the cookhouse on his sheep ranch near Ephrata, Washington. A couple of years ago at shearing time, Tom used this telephone to keep track of the wool market. The information he gathered convinced him prices would strengthen. So, he held off on selling. The market went up 5¢ and Tom's 50,000 lbs. of wool brought an extra $2500. This is a fine example of the importance of having an extension phone handy *when* and *where* you need it.



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Today the extension telephone is a farm tool that pays its way over and over by helping farmers make the most of their time and opportunities. It can do the same for you. Just call the folks at your telephone business office. They'll be glad to help.

BELL TELEPHONE SYSTEM

KEEPING AHEAD

University of Missouri farm management specialists are using the University's electronic computing equipment for a new farm record analysis service available to Missouri farmers for the first time in 1961. *For a* $25 *annual fee, cooperating farmers will receive quarterly and annual reports which will supply information necessary for income tax reporting and for sound management decisions. Heading the new project is Paul Bebermeyer, a veteran of* 13 *years of extension farm management experience.*

Here's A Promising Face Fly Control

Near-perfect control of the bothersome and wide-spread face fly has been achieved — in the laboratory — by adding a small amount of some insecticides to dairy cattle feed.

Experiments show that certain organic phosphorus insecticides pass, largely undigested, through cattle and make their manure highly toxic to face fly larvae. These larvae developed only in fresh manure. This research was conducted at USDA's Agricultural Research Center, Beltsville, Md. Similar studies there indicate this method also may aid in controlling the housefly.

Farmers Form Management Group

A group of 25 San Luis Valley (Colorado) farmers and ranchers are trying a new approach to improving their operations through a cooperative management association.

The new non-profit organization, known as the San Luis Valley Farm and Ranch Management Association, was formed officially last week. Main objectives of the association are to examine farmers' earning power, to diagnose trouble spots in individual operations, recommend changes in farming operations, and to interpret results of current practices and of changes made in the future.

Grow Corn With Less Moisture

Farmers may soon grow crops with a third less water by using a new technique developed at the University of Illinois. This new process conserves water by reducing water losses during periods of high transpiration.

The process utilizes a chemical called hexadecanol. Here's how the technique works: Farmers can add hexadecanol to the soil around the roots of plants. The plants absorb the chemical and scientists believe that the chemical closes some of the small openings on the leaf surface and thus reduces the amount of water lost through transpiration. In corn tests during the past year, water savings have ranged from 17 to 40 percent without affecting yield or quality of the corn.

Immediate use of the process is limited. Although the chemical is available to farmers, there are several problems in using it. First, it is too expensive in its present form. The amount needed for maximum effectiveness is not known. Also, bacteria in certain soils destroy the material before it has been absorbed.

Every Cow Carries Potential Mastitis Germs

More than 50 different "bugs" can cause mastitis. The sad fact about this bad actor — mastitis — is that cows in a herd can have it and the dairy farmer doesn't know it. For example, of the last 25 dairy farms submitting routine samples of milk to be tested in the Michigan State University laboratory, 24 of the herds showed some evidence of mastitis infection.

In another on-the-farm survey of 250 head of dairy cows in central Michigan herds, 141 cows showed some form of mastitis infection.

Lean Hogs From Corn-and-Cob Ration

USDA reports that pigs experimentally fed on corn-and-cob meal produced a greater percentage of lean cuts at lower cost per pound of gain than pigs fed a normal corn ration. In experiments conducted at the Michigan Agricultural Experiment Station pigs fed on the corn-and-cob diet maintained a feed cost of $10.15 per 100 pounds gain, with a carcass yield of more than 54 percent lean cuts. However, the fastest gaining pigs were the control group on a high-energy diet, but their feed cost averaged $10.52 per 100 pounds gain and their yield of lean cuts was only 51 percent.

Dairy Heifers Like Several Meals

Dairy heifers fed grain four and eight times a day gained weight faster than heifers fed twice daily, in tests at the University of Arkansas.

Holstein heifers fed four and eight times a day gained 1.99 and 2.05 pounds per day, respectively. Those fed twice daily during the 90-day test period gained 1.7 pounds a day.

Each heifer received 6.25 pounds of grain throughout the day. This total amount of grain was equally divided into two, four, and eight feedings and fed to three heifers in each feeding interval group.

IN AGRICULTURE

- **Dairy Heifers Gain Faster When Fed Four To Eight Times A Day**
- **Farmers May Soon Be Able To Grow Corn With A Third Less Water**
- **Feed Additive May Put An End To Face Fly . . . And House Fly!**
- **Save Fuel By Operating In Higher Gears With Slower Engine Speed**
- **A Trick Worth Knowing — How To Make $15 Out Of A Quarter**

Fertilizer Spray Boosts Tomato Yields

Early yields of greenhouse tomatoes at the University of Kentucky Experiment Station were increased as much as three times last growing season by spraying them with a solution containing fertilizer, boron, and a growth regulator.

The yields were twice as high as those of the plants which got only the growth regulator.

When boron and growth regulator (called BNA) only was applied, the plants averaged 1.13 pounds of tomatoes per plant. When fertilizer was added to the BNA solution, the yield was 2.93 pounds per plant. The unsprayed plants averaged only 0.66 pounds per plant for early yields.

The large increase (in early yields) apparently is due to the stimulation of leaves and flowers from the fertilizer.

25 Cent Investment Returns $15

Farmers may be able to increase their return per steer above feed costs up to $15 by using 18 to 27 cents worth of stilbestrol, according to University of Tennessee researchers.

At the Middle Tennessee Experiment Station, implanted steers gained an average of 2.22 pounds per day, using 1,115 pounds of feed for 100 pounds of gain, and returned $40.62 per head over feed costs. Steers which got no stilbestrol gained 1.82 pounds per day, used 1,344 pounds of feed per 100 pounds of gain, and returned $28.03 per head over feed costs.

Farmers Can Apply Ammonia As They Plow

University of Illinois agricultural engineers say farmers can save time, money and labor by combining plowing and ammonia application into one operation.

Here's how the University of Illinois research worked:

The engineers set the ammonia tank on top of the plow or disk and let the tank hose trail along in the furrow.

When researchers compared average losses from more than 50 plow, disk and conventional knife application tests, they found that all losses were below one percent, although those with knife application were lowest.

Researchers point out that this way of applying ammonia works equally well for fall and spring plowing.

New Drug For Stomach Worms

New fine particle phenothiazine was much more effective than standard size phenothiazine for treating lambs severly infected with stomach worms in a University of Missouri test.

Even better results were obtained with a new organic phosphate drug called ruelene. Death losses were zero, 12 percent, and 40 percent for the respective treatments of ruelene, and fine particle and standard size phenothiazine.

Ruelene is still in the development stage and not yet on the market.

Tips To Cut Tractor Fuel Costs

Farmers can often save much fuel by operating their tractors at higher gears and reducing speed of the engine, say Michigan State University engineers.

For instance, suppose you are cultivating at three miles per hour with a gasoline engine tractor rated at 50 horsepower. All that is needed to pull the cultivator is 15 horsepower.

Tests have shown that using second gear to travel three miles an hour will use 1.9 gallons of gasoline an hour. However, you can get the same ground speed with this tractor by shifting up to third and cutting the engine speed. Fuel consumption then will drop to 1.4 gallons an hour, a saving of one-half gallon an hour.

Best fuel efficiency comes when the tractor is operated at the slowest engine speed and highest gear that it will pull the load without "lugging" and with normal oil pressure.

Liquid, Dry Fertilizers Equal

Liquid fertilizers are as good as dry ones.

Regardless of the form of fertilizer, if enough plant nutrients were added to meet soil test requirements, yields increased in a two-year test conducted by University of Illinois agronomists.

The type of fertilizer to use depends on (1) how well it fits the field and crop's needs, (2) how convenient it is to handle and apply and (3) what it costs per unit of plant nutrients.

Liquid fertilizers seemed to be just as good as, but no better than, other fertilizers.

TABLE 1. FARMS OPERATED BY TENANTS

Census year	Percent of farms operated by tenants	Census year	Percent of farms operated by tenants
1959...	20.5	1925...	38.6
1954...	24.4	1920...	38.1
1950...	26.8	1910...	37.0
1945...	31.7	1900...	35.3
1940...	38.7	1890...	28.4
1935...	42.1	1880...	25.6
1930...	42.4		

TABLE 2. AVERAGE SIZE OF FARM

Census year	Average size of farm (acres)	Census year	Average size of farm (acres)
1959...	302.4	1925...	145.1
1954...	242.2	1920...	148.2
1950...	215.3	1910...	138.1
1945...	194.8	1900...	146.2
1940...	174.0	1890...	136.5
1935...	154.8	1880...	133.7
1930...	156.9		

1954-1959: YEARS OF CHANGE *for U. S. Agriculture*

Now it's official — farmers are leaving the land at an unprecedented rate. One in four left in the five-year period — 1954-1959. What's more, the 1959 Census of Agriculture shows we have fewer farms than at any time since 1870. The facts about the greatest period of change in history are reported in this special summary of the 1959 Census of Agriculture.

● ONE FARMER IN FOUR went out of business! Shades of the Civil War, we're back to 1870 in number of farms! These are only two facts from the most exciting Agricultural Census in decades.

Yes, the Census — covering 1954 to 1959 — proves what has been said all along — farms are getting fewer and larger. Just how few and how large? Well, the number of farms counted, 3,703,642, was the smallest number of farms reported by any census of agriculture since 1870. The number of census farms in 1959 was 23 percent less than in 1954 — down 1,079,000. (The change in definition of a farm accounted for 232,000 of this decrease.)

The change in the number of farms during the five-year period 1954-1959, was greater than during any five-year period recorded by the census. The number of farms in 1959

TABLE 3. CHANGE IN NUMBER OF FARMS

Size of farm	Number of farms				
	1959	1954	1950	1925	1900
Total.....	3,703,642	4,782,416	5,382,162	6,371,640	5,737,372
Under 10 acres....	240,693	484,291	484,914	398,535	287,229
10 to 49 acres....	811,117	1,212,831	1,477,830	2,038,692	1,664,197
50 to 69 acres....	258,026	346,323	426,887	1,421,098	1,346,038
70 to 99 acres....	399,625	517,740	630,984		
100 to 139 acres..	394,380	481,458	579,111		
140 to 179 acres..	377,839	461,651	523,451	1,887,194	1,912,332
180 to 219 acres..	225,513	297,189	275,009		
220 to 259 acres..	188,831	206,309	212,316		
260 to 499 acres..	471,382	482,246	478,084	436,961	377,991
500 to 999 acres..	199,997	191,697	182,264	143,832	202,536
1,000 acres and over.....	136,259	130,481	121,362	63,328	47,148

TABLE 4. PERCENT OPERATORS OWNING FARMS

Census year	Percent of farm operators owning part or all of farm operated	Census year	Percent of farm operators owning part or all of farm operated
1959...	79.0	1925...	60.
1954...	75.6	1920...	60.
1950...	72.7	1910...	62.
1945...	67.6	1900...	63.
1940...	60.7	1890...	71.
1935...	57.2	1880...	74.
1930...	56.7		

TABLE 3. NUMBER OF FARMS

Value of farm products sold	Number of farms, 1959		Number of farms according to 1954 definition of a farm		
	Total (000)	Percent of all farms	1959 (000)	1954 (000)	Percent change 1954 to 1959
Total	3,704	100.0	3,936	4,783	-17.7
$10,000 and over	794	21.4	794	583	+36.2
$5,000 to $9,999	654	17.7	654	707	-7.5
$2,500 to $4,999	618	16.7	618	812	-23.9
$2,500 and over	2,066	55.8	2,066	2,102	-1.7
Less than $2,500	1,638	44.2	1,870	2,681	-30.2

TABLE 4. OPERATORS WORKING OFF FARMS

Census year	Farm operators working off their farms total		Farm operators working off their farms 100 days or more		
	Number	Percent of all operators	Number	Percent of all operators	Percent of farm operators working off their farms
1959	1,649,627	44.5	1,115,914	30.1	67.6
1954	2,153,737	45.0	1,333,725	27.9	61.9
1949	2,099,634	38.8	1,254,630	23.3	60.0
1944	1,970,397	36.8	1,079,084	18.4	48.7
1939	1,747,189	28.7	943,981	15.5	54.0
1934	2,077,474	30.9	780,772	11.2	36.6
1929	1,902,898	30.3	723,298	11.5	38.0

was less than in 1954 in every state and in all except 42 counties in the 48 states.

Where Big Drop Came

Most of the decrease from 1954 in the number of farms occurred in farms having less than 220 acres. Farms of less than 10 acres declined 50 percent during the five years. A large part of this decline resulted from the change in the definition of a farm. Farms 10 to 69 acres in size decreased almost three-fourths of a million during the five-year period.

More than 70 percent of this decrease occurred in the 16 Southern states where, with the decline in the number of croppers and share tenants, there was significant reorganization in the agricultural operations on individual farms.

In 1925, there were 63,328 farms of 1,000 acres and over in the 48 states. By 1959, this number had increased to 136,259. The number of farms 500 acres and over increased 62 percent during the last 35 years. Farms 500 acres and over now comprise 9 percent of the farms in the 48 states.

Fewer Farm Tenants

The proportion of farms operated by tenants was lower in 1959 than for any other census since 1880, the first census for which data on farm tenancy are available. In 1959, the percentage of farms operated by tenants was less than half that in 1935. (See Table 1)

During the last 30 years there has been a continued decline in the number of sharecroppers in the 16 Southern states comprising the South. There were less than one-sixth as many share-croppers in 1959 as in

(*Continued on page* 20)

1959 CENSUS HIGHLIGHTS

- The number of farms decreased 23 percent.
- Average farm size up 60 acres — to 302.4.
- Much greater specialization and commercialization occurred than at any time in history.
- Farms of less than 10 acres declined 50 percent with big decrease in all farms below 220 acres.
- Farms 500 acres and over now account for 9 percent of all farms.
- Land in farms declined 38 million acres — a 3 percent drop.

TABLE 7. ALL LAND IN FARMS

Census year	Acres	Increase or decrease (-) from preceding Census	
		Acres	Percent
1959	1,120,088,729	-38,102,782	-3.3
1954	1,158,191,511	-374,341	-
1950	1,158,565,852	16,990,488	1.5
1945	1,141,615,364	80,762,990	7.6
1940	1,060,852,374	6,337,263	0.6
1935	1,054,515,111	67,744,095	6.9
1930	986,771,016	62,451,664	6.8
1925	924,319,352	-31,564,363	-3.3

TABLE 8. VALUE OF LAND AND BUILDINGS

Census year	Average per farm (dollars)	Average per acre (dollars)	Census year	Average per farm (dollars)	Average per acre (dollars)
1959	33,242	121.04	1920	10,284	69.38
1954	20,405	84.25	1910	5,471	39.60
1950	13,983	64.96	1900	2,696	19.81
1945	7,917	40.63	1890	2,909	21.31
1940	5,518	31.71	1880	2,544	19.02
1935	4,823	31.16	1870	2,799	18.26
1930	7,614	48.52	1860	3,251	16.32
1925	7,764	33.52	1850	2,258	11.14

WHY FARMERS PRODUCE

● OUR FARM PRODUCTION has increased 50 percent since 1940—by 25 percent in the last 10 years. Our grain stocks are almost large enough for two years of normal domestic and export needs. How has farm output grown so rapidly? Why?

Last month we looked mainly at the forces operating "outside of" agriculture and their impact on farming (see "What Agriculture Is Up Against", page 22, February Better Farming Methods).

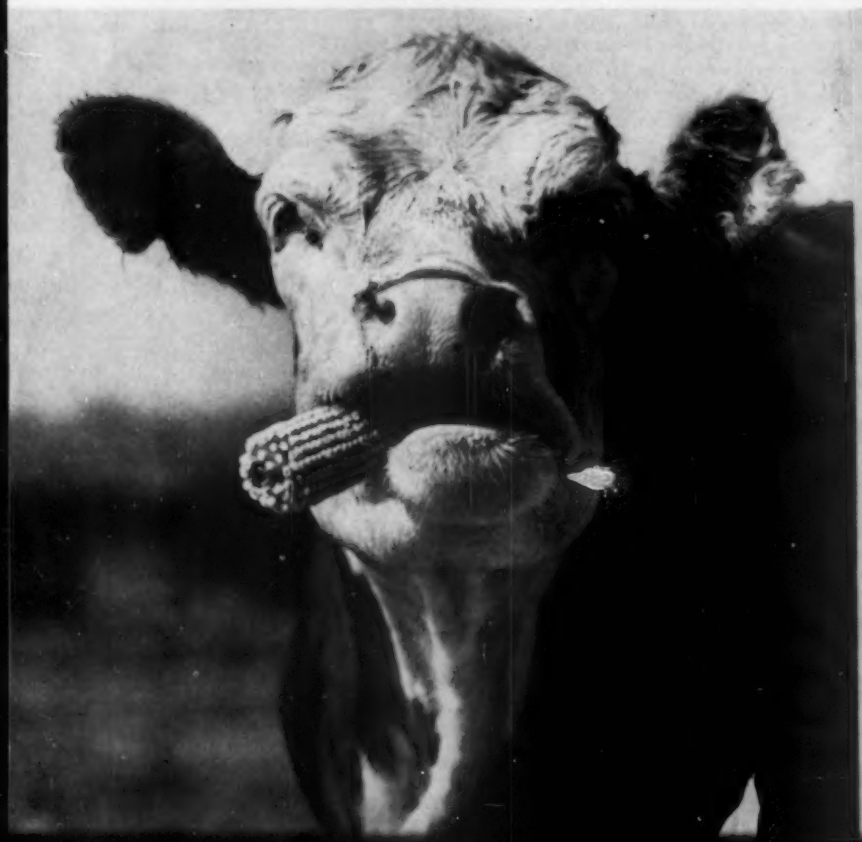
We indicated that agriculture's predicament isn't exclusively a problem of agriculture's own making—that it stems partly from the economic growth and development of the nation as a whole. We pointed out that the forces stemming from the changes in our national economy are the ones which tend to dictate agriculture's place and role as a part of the national economy.

This month, let's look at the supply or surplus production problem *within* agriculture.

Why So Much?

How has agriculture reached its surplus position? With about the same amount of total acres and with a decreasing farm population, the answer, at first glance, looks simple—improved technology. But there's much more than this behind the increase in agriculture's productivity.

New technology isn't adopted just for technology's sake—at least not in an economy such as ours. The new



MORE GRAIN, MORE COWS...

Bossy has the right idea, but even swallowing 'em whole won't get rid of two year's supply of grain stocks. Already, many experts are predicting a collapse in livestock prices in the next couple of years because we can't seem to slow down our run-away farm production machine. Why do we continue to push for higher and higher production when we know it spells disaster? This feature attempts to answer this question.

TOO MUCH

technology is adopted by farm operators *if*, and only if, it's *profitable* to use it.

The application of new technology often calls for more or different resources to go along with it. Chemicals used for weed and insect control, for example, tend to increase output. But these chemicals aren't just new technology as such. They're resources or inputs that have to be purchased. And to be adopted, they must control weeds or insects more cheaply, effectively or easily than older methods. Fertilizer, likewise, isn't just a new practice that can be freely adopted or not. It's a material resource, requiring a cash outlay. The same is true of the seed of a new crop variety, a new feed ingredient or mixture, or a new piece of machinery—any of which may help increase yield or replace labor.

There are a few important developments in farm practices or technology that, in this day and age, are costless. Adoption, therefore, depends not only on awareness, custom, status, etc., but especially on profitability.

Must Be Profitable

To be adopted, a new technique must give or promise a profit. Whether it increases output, does a better job than other methods or substitutes for other resources, the return from adopting a new technique must still be enough to make it worthwhile. The resources used in applying the new technology must be priced favorably in relation to the prices of the products they produce.

Three things are important with regard to the possible profitability of a new technique or practice:

1. The amount it adds to production.

2. The cost of the resources necessary to use it in relation to the price of the output it produces.

3. The cost of the resource in relation to the cost of the other resources for which it may substitute.

Here's an example. Suppose a new practice (or, more exactly, the resources it calls for) is applied as a dose of

(*Continued on page* 22)

Condensed from, "Why and How Do We Produce So Much", Iowa Farm Science. Authors of the original article are Earl O. Heady, professor of agricultural economics and executive director of the Center for Agricultural and Economic Adjustment, and John F. Heer, editor of Iowa Farm Science.

C★★★

TWO EARS NOW . . . THREE TOMORROW?

Growing two ears where one used to grow is no trick for American farmers who have increased production by one-half since 1940. The big question is: "If our surplus output depresses both farm product prices and farm family income, why do farmers continue to produce too much?" The answer, as outlined in this article, is that adopting new technology has proved profitable to the farmer — and new technology is responsible for our surplus production.

If technology causes surplus, and surplus lowers prices, why don't farmers refuse to adopt it?

ECHOES

letters from our readers

FARMER TAKES THE BLAME

Your magazine is still maintaining the standard set last spring.

I especially liked the article, "A Farmer Answers His Critics", by Mr. Haigler . . .

I don't believe as a nation we can afford to let a part of our economy as important as agriculture receive such a small part of the national income . . .

We farmers resent many things charged to us that others are receiving the cash benefits from. One I think of just now is the cost of the corn program which I understand cost our government 271 million dollars — of this, transportation and storage received 110 million — this money did not go to farmers by any stretch of the imagination, but it was all charged to the farmer. — *Reese Van Vranken, Climax, Michigan.*

WHAT IS PROSPERITY?

Mr. Robert Haigler's article, "A Farmer Answers His Critics" in the January issue of Better Farming Methods is the best I have seen, on this subject. He has very clearly pointed out the facts that have produced the condition in which we as farmers, and as a nation, find ourselves . . .

The American farmer is the most efficient producer in the United States, perhaps not because he wants to be, but because he has no monopolistic power, which will allow him to increase his wage without increasing his efficiency and charge the increased cost to the purchaser of his product as is done by labor unions in industry. Can the farmers, the independent wage earners, not controlled by unions, and the professional people of this land somehow combine to curb the labor monopoly?

High prices are not a sign of prosperity. Prosperity comes from being able to buy more goods and services with the money you have. Efficiency in all endeavor brings about lower prices with the same or lower costs. Manipulated high costs whether by high wages demanded by organized labor or by high minimum wages demanded by federal statutes, can only reduce efficiency, increase costs and continue to produce inflation. — *E. E. Huff, Farm Service Company, Chickasha, Oklahoma.*

YOUR IDEAS

This page is reserved each month so each reader of Better Farming Methods may "sound off" on any farm subject he desires. You may have some comment on the things you read in this issue. If so, send your ideas to us. We'll share them with other "thought leaders" of agriculture who are regular readers of Better Farming Methods.

A REVOLUTIONARY PLAN

Dear Senator Mundt:

Time is again at hand when discussion on a new farm legislative act will be at it's height. It appears we will not again have the opportunity to speak at the "Grass Roots" as we did in Brookings in 1957. No doubt the Agricultural Committee of the Senate will again be in session, of which you were a member and, I hope, will be again . . .

I am about to present to you what I think is a revolutionary approach to the farm surplus problem and hope you give the idea some serious thought. Instead of attacking the problem from the production and price angle I suggest we climb the fence and attack the cost of production where the culprit is really found.

. . . I want to refer you to an article in the January 1961 issue of Better Farming Methods by Robert Haigler, entitled, "A Farmer Answers His Critics". I refer you to this article because it explains my thoughts on the ailments of agriculture better than I can myself and with more authority . . .

My plan is one to correct this in part and likewise place the blame where it belongs until such time as the economic situation is balanced on a parity basis. I suggest we drop most all of the price support programs and work out a law that will permit all legitimate farm operators to reduce their cost of production by placing as many of the production item needs as possible on a parity basis on the retail level and available to the farmer at that price . . . — *R. A. Englehorn, Menno, South Dakota.*

BFM OFFERS ME MORE

I received your first issue of Better Farming Methods and find it to be a very fine magazine that meets the needs of today's farmers. I subscribe to several of the farm magazines, but find this magazine offers me more than any other. I appreciate you including me on your list of farmers . . . — *James R. Oliver, Homestead Acres, Fairmont, North Carolina.*

ANALYSIS OF FARM PROBLEM

Please list us as a new subscriber to Better Farming Methods. We would like to request permission to use some of your editorial material from time to time in our Farm Bureau News column in our two local newspapers, *The Shelby News* and *The Shelby Sentinel*, and occasionally in our Farm Bureau Monthly News Letter.

Your editorials and articles are exceptionally good and timely and have a better analysis of the farm problem than any I have ever read . . . — *James B. Hays, Organizational Director, Shelby County Farm Bureau, Shelbyville, Kentucky.*

READ "ECHOES" LETTERS

Reading the letters from "Echoes" I would like to express my thanks to Better Farming Methods.

I certainly like the articles in your magazine, and find them very useful. — *Bill McCalla, R. R. 5, Ann Arbor, Michigan.*

WHY FARMERS ARE TOPS

I have read your editorial in the last issue of "Better Farming Methods" on the subject, "Why U. S. Farmers Are Tops". I want to commend you for this article for I think it is certainly well done. — *Carl E. Rose, County Agent, Fayetteville, Arkansas.*

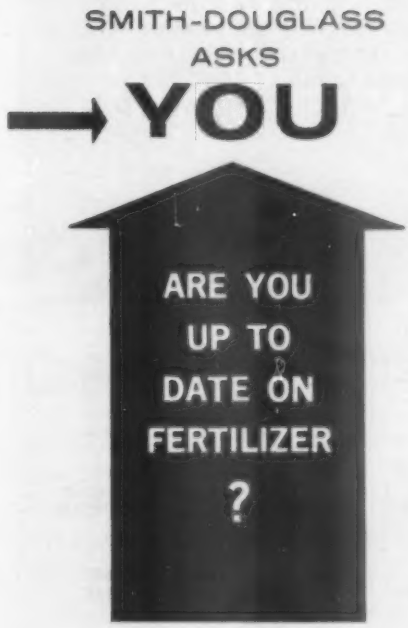
HELPFUL TO FARMERS

Would like to thank you for receiving BFM. It is such a helpful and interesting magazine for those of us in "farming business" . . . — *Erick Larson, Jr., Hornick, Iowa.*

C★★★

There are many kinds of Nitrogen

Check yourself on the following question. Don't be surprised if you miss. Fertilizers are a rapidly changing part of our agricultural economy.



We recently said that all fertilizers of the same analysis were not alike, even though they would pass the state test.

Why aren't they the same? They are guaranteed by state law, aren't they?

Yes, the law sets up certain minimums. Most fertilizers, including Smith-Douglass meet these minimums. But the law does not usually specify any specific kind of nitrogen. There are many kinds of nitrogen, but Smith-Douglass PELLEFORM contains primarily ammonium nitrogen. Ammonium nitrogen means less leaching. Recent research has shown that ammonium nitrogen in a mixed fertilizer definitely increases the efficiency and uptake of phosphate much better than nitrate nitrogen.

You can tell it's PELLEFORM by the uniform pellets and the Smith-Douglass trademark on the bag.

You can also tell it's Smith-Douglass by the extra bushels at harvest time.

FARM TRENDS

A quick summary of developments in agriculture

FARMS 500 ACRES AND OVER have increased 62 percent during the last 35 years — now comprise 9 percent of total farms. On the other hand, farms of less than 10 acres decreased 50 percent from 1954 to 1959.

THE NUMBER OF FARMS COUNTED in the 1959 Census, 3,703,642, was the smallest number since 1870. The number of farms in 1959 was 1,079,000 less than in 1954 — a whopping 23 percent decline. Part of this decline — 232,000 – resulted from the change in the census definition of a farm.

NET FARM INCOME ROSE throughout 1960 with the annual rate of net income in the fourth quarter estimated at $12.4 billion, nearly 15 percent above the same period in 1959. For the year, net income totaled about $11.6 billion — 3 percent above 1959 but 11 percent less than the $13 billion in 1958.

HOW MUCH FOOD WILL WE NEED in 1975. USDA economists estimate we'll need 45 percent more livestock, 25 percent more crops. If farmers applied all known technology we could meet these needs with 27 million fewer acres of cropland and 46 million fewer acres of pastureland.

MORE PIGS ARE IN PROSPECT this spring. A 5 percent jump is expected because of farmers' intentions to farrow 4 percent more sows and an expected gain of 1 percent in pigs saved per litter. However, hog prices will continue well above those of 1960 for several months. Decline is expected this fall.

FARM BUSINESS CONDITIONS

Farm income up
Employment down
Parity ratio up
Marketings down
Farm Deposits down

ITEMS	Dec. 1960	Nov. 1960	Dec. 1959
PRICES:			
Received by farmers (1947-49 = 100)	89	89	85
Paid by farmers (1947-49 = 100)	119	119	108
Parity price ratio (1910-14 = 100)	81	81	78
Wholesale, all commodities (1947-49 = 100)	120	120	119
Paid by consumers (1947-49 = 100)	—	127	126
LABOR:			
Farm labor, U. S. (dol. per week without board)	—	43.73[a]	42.00[a]
Factory labor, U. S. (dol. earned per week)	90.02	90.16	92.16
PRODUCTION:			
Industrial, physical volume (1947-49 = 100)	156	159	165
Farm marketings, physical volume (1947-49 = 100)	142	171	159
INCOME PAYMENTS:			
Total personal income, U.S. (annual rate, bil. of dol.)	—	410	394
Cash farm income, U. S. [1](annual rate, bil. of dol.)	—	38	36
EMPLOYMENT:			
Farm (millions)	4.9	5.7	4.8
Nonagricultural (millions)	61.1	61.5	60.9
FINANCIAL (District member banks):			
Demand deposits:			
Agricultural banks (1955 monthly avg. — = 100)	103.0	104.4	103.0
Nonagricultural banks (1955 monthly avg. = 100)	107.1	104.6	107.7
Time deposits:			
Agricultural banks (1955 monthly avg. = 100)	136.9	136.8	130.0
Nonagricultural banks (1955 monthly avg. = 100)	134.6	133.6	125.7

[a]October

[1]Based on estimated monthly income.

Compiled by the Research Department, Federal Reserve Bank of Chicago

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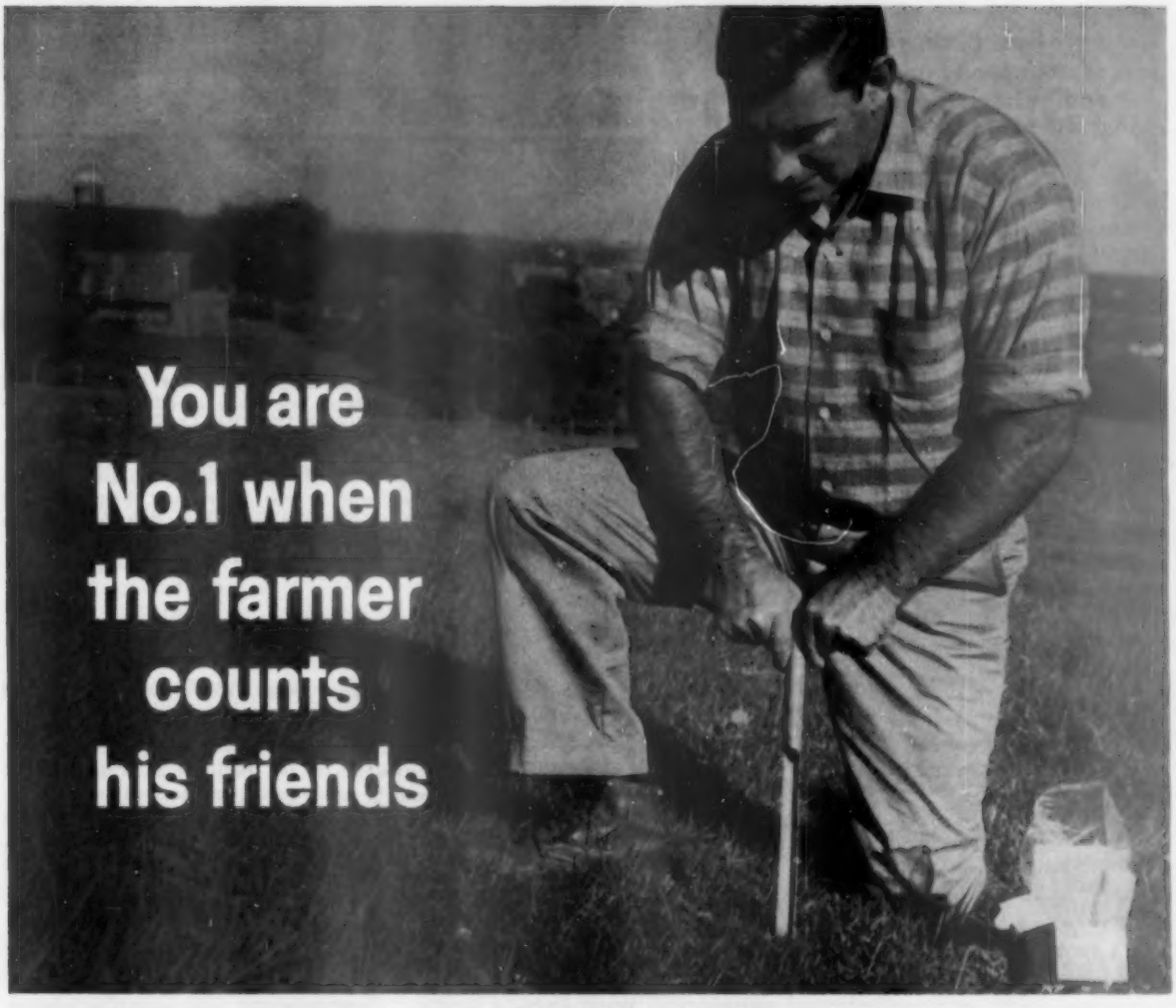

County Agricultural Agents are "at home" everywhere

In the field, at meetings, in the office . . . the County Agricultural Agent is the farmer's best friend. You're warmly welcomed wherever you go . . . because you're the "man in the know."

Today's farmers, sometimes "worlds apart" from Experiment Station labs, depend upon you to keep their "schooling" up-to-date. You are the vital link between the research scientist and the farmer. You help the farmer put new knowledge to work . . . for his own benefit, and that of all America.

We at Royster are proud to work closely with the Nation's County Agricultural Agents in keeping today's farmer informed about the latest techniques of profitable farming.

To aid in this, Royster has prepared a free, full-color booklet, titled, "It's a Good Life." It tells simply and directly the important and true relationship between fertilization and increased farm profits. Both 4-H Club members and adult farmers are sure to find it interesting and informative.

WRITE TODAY FOR YOUR FREE COPY, or copies . . . for field work, for meetings, for office, or your personal use.

Fertilizer . . . and fertilizer only . . . since 1885

Royster

The Quality Name in Plant Food
F. S. Royster Guano Co., Norfolk, Virginia

C★★★

Free films you can use at community meetings, with school groups, etc. Select films and order with the coupons below.

VISUAL AIDS

MODERN TALKING PICTURE SERVICE, INC.
3 East 54th Street
New York 22, New York

Please send me your movie "Tomorrow's Trees" for showing on the date indicated below:

DATE: .....

ALTERNATE DATE: .....

NAME: .....

ADDRESS: .....

CITY & STATE: .....

BETTER FARMING METHODS, March 1961

TOMORROW'S TREES, 16 mm., sound, color, 30 minutes. Sponsored by Weyerhaeuser Company.

Amid the grandeur of America's Pacific Northwest, the camera portrays interlocking struggles of nature as growing tree crops fight for survival. Ravaged by wildlife, fires and cyclonic gales, tomorrow's trees are constantly replenished by man.

"Tomorrow's Trees" takes you into the tall-tree country for a firsthand look at timber operations that make you wonder how nature built these great forests without the help of man. Then you'll see how man is helping nature to insure wood for the future. (This film is not available to schools below senior high level.)

MODERN TALKING PICTURE SERVICE, INC.
3 East 54th Street
New York 22, New York

Please send me your movie "Power Tools For You" for showing on the date indicated below:

DATE: .....

ALTERNATE DATE: .....

NAME: .....

ADDRESS: .....

CITY & STATE: .....

BETTER FARMING METHODS, March 1961

POWER TOOLS FOR YOU, 16 mm., sound, color, 15 minutes. Presented by Sears, Roebuck and Company.

"Power Tools For You" is an excellent film for vo-ag shop classes. It explains the selection and use of power tools for specific jobs, with examples of do-it-yourself projects that can be made easily, inexpensively.

During this film your classes will see many examples of power tool use that will be helpful to them in carrying out their own shop projects. Also, they will learn something about the limitations of each tool and the selection of the right tool for the right job.

Film Department
ALLIED MILLS, INC.
Fort Wayne 1, Indiana

Please send me your movie "Producing Tomorrow's Hogs . . . Today" for showing on the date indicated below:

DATE: .....

ALTERNATE DATE: .....

NAME: .....

ADDRESS: .....

CITY & STATE: .....

BETTER FARMING METHODS, March 1961

PRODUCING TOMORROW'S HOGS . . . TODAY, 35 mm. stripfilm, sound, color. Presented by Allied Mills, Inc.

This film brings together information from various agricultural college experiment stations and from Allied's own research farm. It deals with such questions as, "If I'm to stay in the hog business, do I have to get big?" — "How do I select gilts and boars for most efficient production?" — "Can I afford to raise meat-type hogs?" "The pro and con of concrete vs. pasture raising" and other questions of interest to hog producers.

Basically, everything contained in this film is a good hard look at what's happening in the hog business and what can be done to keep a hog program operating efficiently in the future.

MODERN TALKING PICTURE SERVICE, INC.
3 East 54th Street
New York 22, New York

Please send me your movie "Morea Liquid Feed" for showing on the date indicated below:

DATE: .....

ALTERNATE DATE: .....

NAME: .....

ADDRESS: .....

CITY & STATE: .....

BETTER FARMING METHODS, March 1961

MOREA LIQUID FEED, 16 mm., sound, color; 20 minutes. Presented by U. S. Industrial Chemicals Company and Feed Service Corporation.

This film tells about MOREA liquid feed, a supplement for meat improvement in the cattle and sheep industries.

This film takes you to farms and feedlots where you'll see beef cattle and sheep on special feeding programs supplemented by MOREA. Also, range feeding operations and meat quality are covered in this interesting 20-minute film.

THESE FILMS ARE LISTED AS A SERVICE TO OUR READERS. ALL FILMS ARE FREE EXCEPT FOR TRANSPORTATION COSTS. ORDER THEM FOR USE IN YOUR WORK.

C★★★

CLIMAX MOLYBDENUM

MOLY-GRO NEWS

CLIMAX MOLYBDENUM COMPANY, a division of American Metal Climax, Inc., 1270 Avenue of the Americas, New York 20, N.Y.

MOLYBDENUM ESSENTIAL TO PLANT LIFE

Leading Universities Continue Development Work on Molybdenum

The Climax Molybdenum Company is co-operating with several leading universities in continuing research on the benefits of molybdenum as a trace element. Development work is presently being carried on at the Universities of Cornell, Purdue, and Wisconsin, plus others strategically located in major American agricultural areas.

Soybean Growers Report Yield Increases by Treating Seed with Moly-Gro

In 1960, a survey was made among Missouri and Illinois soybean growers who conducted comparison tests on either their entire acreage or on test strips. Almost 40% received yield increases averaging 4.14 bushels per acre where Moly-Gro was used.

Another 30% mentioned other benefits such as . . . "better stands" . . . "better plants" . . . "more pods" . . . "more nodulation".

The cost of treating with Moly-Gro is approximately 35-cents per acre. The average 4 bushel per acre increase would represent a return of around $8.00 for each 35-cents spent.

You can get Moly-Gro at leading seed stores in Illinois and Missouri. For more information write to us at the above address.

Treatment with Moly-Gro a Factor in Obtaining Optimum Growth

Molybdenum, as agronomists know, is a trace element essential to all plant life. It has two important functions in plants: (1) All plants require a trace of molybdenum to change nitrate nitrogen into a form suitable for protein manufacture and (2) the root nodule bacteria of legumes need it for nitrogen fixation. If inadequate molybdenum is present, effective nodulation may be retarded. As a result, growth can be stunted and good stands can become difficult to establish and maintain; yield and protein content of the forage may be reduced.

Normally, plants satisfy their molybdenum requirements from the soil. However, there are a number of limiting factors to this source depending upon (1) geological origin of the soil; (2) age of the soil; and (3) amount of rainfall.

Fertility programs, coupled with good cropping practices, are other factors determining molybdenum response. Liming the soil releases that molybdenum tied up by the acid condition. However, this may or may not be enough molybdenum to supply crop requirements.

Here is where Moly-Gro fits into the picture. Moly-Gro contains molybdenum specifically compounded for agricultural use. It is available for all types of application . . . seed treatment, fertilizer additive and foliar spray. Not an inoculant, Moly-Gro is made to be compatible with inoculants and various chemical treatments. Its use can insure an adequate supply of molybdenum for optimum plant growth.

Successful applications of Moly-Gro to date have shown increased yields up to 20% in such crops as alfalfa, soybeans, dry-seed peas, clover and, in certain areas, peanuts and tobacco. Vegetables and citrus fruits have also shown positive reactions.

WHO MAKES MOLY-GRO?

The Climax Molybdenum Company is a division of American Metal Climax, Inc., one of the world's largest extractors, manufacturers and marketers of minerals.

Climax owns and operates the largest single molybdenum mine in the free world. Located in Climax, Colorado, the Climax Molybdenum mine accounts for 60% of the world's total molybdenum production. More importantly, our research laboratories, co-operating with leading universities, are continually seeking new and better ways of using molybdenum, not only as a trace element in agriculture but also as a metal, as a lubricant, and, as a chemical in highly diverse industries.

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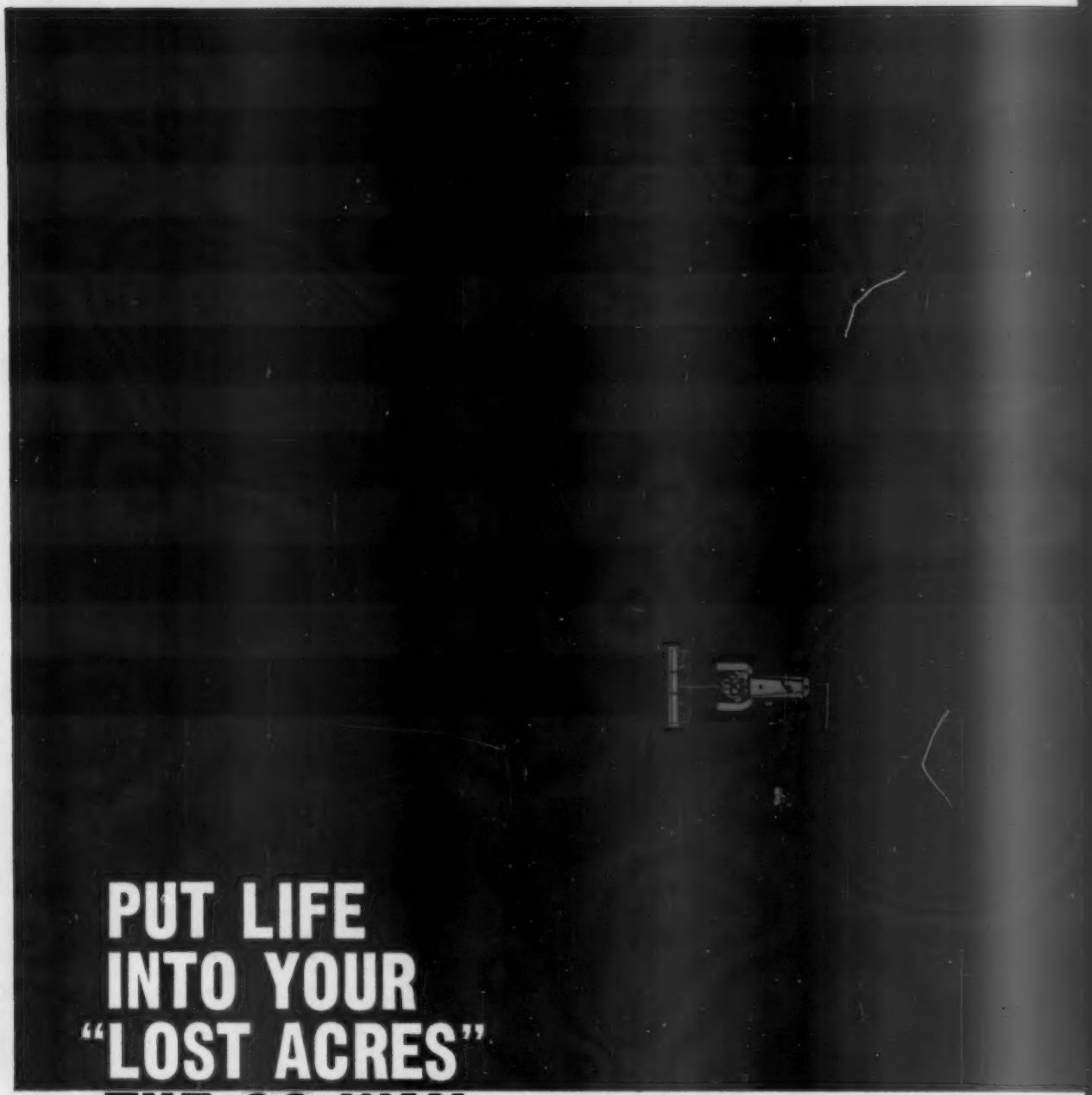


PUT LIFE INTO YOUR "LOST ACRES" THE 3G WAY

GET YOUR SOIL TESTED

GIVE YOUR SOIL THE 3G IT NEEDS

GROW MORE—PROFIT MORE ON EVERY ACRE

Lost acres are made by profits you never took in. Suppose you have 100 acres but they produce only 80% of their capacity. That's just like losing 20 acres and the profits that go with 20 acres. When you put life into your *lost acres* by fertilizing the DAVCO 3G WAY, you start collecting greater profits without the need to buy or work more land than you actually have.

The procedure is simple. First, test your soil. The recommendation you get from your State University or County Agent will tell you exactly what your soil needs. Then contact your DAVCO 3G Agent. He

C★★★

Lost Acres

and what to do about them

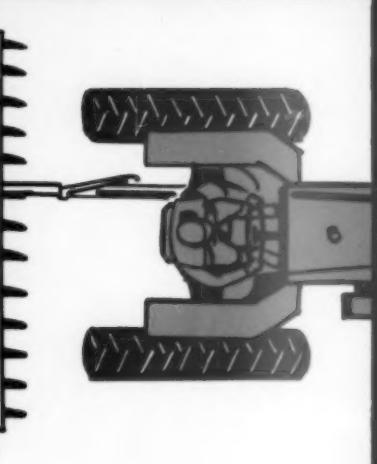
FACTS YOU SHOULD KNOW ABOUT FERTILIZING

GRACE

DAVISON CHEMICAL

W. R. Grace & Co.
Davison Chemical Division
Baltimore, Maryland

JUST WHAT ARE Lost Acres

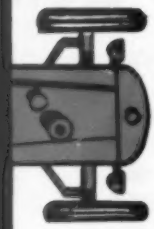


LOST ACRES are made by profits you never took in. Suppose you have 100 acres but they produce only 80% of their capacity. That's just like losing 20 acres and the profits that go with that much land.

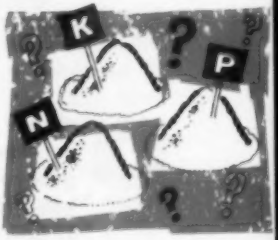
With DAVCO 3G Fertilizer you can put life back into those lost acres. You can start collecting the profits of a fully productive land, without having to buy or work more acres.

The storehouse of handy information in this booklet will help you to a better understanding of the factors that can lead to *lost* acres and the ways in which an outstanding fertilizer like DAVCO 3G can help you put life — and profits — back into your land.

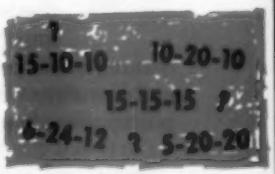
What is Fertilizer?



Fertilizer is commonly thought of as a substance which helps plants grow better by providing them with the nourishment they need. As a general rule, fertilizer is applied to the soil and enters the plant through the root system; however, there are special occasions when the fertilizer is applied directly to the leaves of the plant.



Usually fertilizer contains one or more of three primary plant food elements which are necessary for plant growth: nitrogen (N) available phosphate (P_2O_5), and potash (K_2O). There are fifteen recognized plant food elements which are considered essential to plant growth including the primary plant food elements—nitrogen, phosphate and potash. In order that all of the needed elements may be applied at the same time, two or more of these plant food materials may be combined chemically to form what are known as mixed fertilizers. (DAVCO 3G is a good example.) Such mixtures aren't easy to make. It takes complex chemical equipment as well as know-how to get a product with a uniform composition of the desired analysis.



The *analysis* of a fertilizer refers to the amount of the primary plant foods present in the mixture. It is generally expressed in three sets of figures, like 5-10-15. The first figure always shows the percentage of nitrogen (N), the second available phosphate (P_2O_5) and the third always shows the percentage of potash (K_2O) available in the mixture. Thus, 100 lbs. of DAVCO 3G with a 5-10-15 analysis would have in it 5 pounds N, 10 pounds P_2O_5 and 15 pounds K_2O. (DAVCO 3G is available in a wide variety of analyses for all types of use.)

Plant nutrients . . . how do

PRIMARY PLANT FOOD ELEMENTS

N means nitrogen. It gives the rich, green color to plants and accelerates their growth. It makes the quality of leaf crops better, promotes bigger yields and, generally, increases the protein content of all crops. In the soil, it feeds the microorganisms as they decompose low-nitrogen organic materials.

P stands for phosphorus which, in fertilizer, is generally expressed as available phosphate (P_2O_5). Phosphorus gets young plants off to a good start, stimulates strong, healthy root development and accelerates maturity. It also helps blooming and seed formation and makes fall-seeded grains and hay crops hardy for winter.

K is the symbol of potassium, usually expressed as potash (K_2O) in fertilizer. It helps plants to a more vigorous growth and to increased resistance to various diseases. It aids in the development of root systems, improves plant quality and helps reduce lodging by making stalk parts stiff. Potash is necessary for the formation and transfer of oils, sugars and starches and it also increases the plumpness of grains and seeds.

hey benefit plant growth?

SECONDARY PLANT FOOD ELEMENTS

Although plants do not require them to as great an extent as the primary plant foods discussed above, secondary plant foods still play an important part in the development of plants and are used by them in fairly substantial quantities.

Ca stands for calcium. This nutrient promotes early root development, promotes plant vigor, helps seed and grain production and stiffens straw. Also, it influences the intake of other plant foods, neutralizes poisons produced in the plant and increases the calcium content of food and feed crops. The best known source of calcium is lime.

Mg represents magnesium, one of the basic ingredients of chlorophyll. Essential for the manufacture of sugar within the plant, it also acts as a carrier of phosphorus, regulates ingestion of other plant foods, helps to form oils and fats and is important for starch transfer.

S means sulfur. This element encourages both root and plant growth. It has a beneficial influence on seed production, helps the formation of nodules on legumes and helps plants maintain their dark green color.

MINOR OR TRACE ELEMENTS

Plants need only very small amounts of these elements which, generally, can be found in adequate amounts in most soils. Still, a deficiency in one or more of these elements can have a severely detrimental effect on plant growth. These elements are: Boron (B), copper (Cu), Iron (Fe), manganese (Mn), molybdenum (Mo), and zinc (Zn).

How primary nutrients work in the soil

NITROGEN

In unfertilized soils, most nitrogen is found in the humus coating of the soil particles. Bacteria convert it into either the ammonia or the nitrate form. The plant is able to use both. Ammonia generally clings to clay, while nitrates do not and, as a result, can move about in soil water. To get nitrogen from the air, some plants, such as legumes, grow nodules through the stimulation of nitrogen-fixing bacteria. These bacteria then pass nitrogen to the plant and release some nitrogen into the soil when the nodule decays.

Fertilizer containing nitrogen can supply nitrogen to the soil in various forms, such as ammonia, nitrates or organic.

PHOSPHORUS

Phosphorus can enter the soil from plant materials, manure and fertilizer, but only a very small quantity enters the soil water because most of this element tends to become fixed to clay particles. Iron and aluminum oxides present in the soil form insoluble compounds with phosphorus and are the worst offenders in fixing it. If, however, lime is added to the soil, the calcium of the lime replaces the iron and aluminum from the phosphorus compound. The result is that the insoluble phosphorus then becomes available to the plant. The best way to reduce the fixing of phosphorus in the soil is to concentrate it in fertilizer bands rather than mixing it through the soil.

Fertilizers containing phosphorus are generally formulated from one or more of the following phosphate materials: super phosphate, triple super phosphate, ammonium phosphate and liquid phosphoric acid.

POTASSIUM

An interesting fact about potash is that the plant never takes it up permanently. Rather, potash is only present in the sap with the result that when the plant dies the potash is leached back into the soil. Once in the soil, potassium immediately adheres to the nearest clay particle and clings to it, so that the root of the plant must come and take it off the clay. Potassium can also become part of the clay. Once this happens it becomes very difficult for the plant to get to it and the soil may become deficient in potash.

Fertilizers containing potassium are generally formulated from muriate of potash, sulphate of potash and potassium nitrate.

How plant food is removed from the soil

The plant food content of soil can become depleted in three ways. First, every harvested crop takes its toll in nutrients. In order to grow, every plant removes a certain amount of plant food from the soil and unless this is returned the fertility of the soil suffers. Livestock, too, remove considerable quantities of plant nutrients through grazing.

The second major loss of plant food occurs through erosion and leaching; the third through chemical fixation of some plant nutrients like phosphorus and potassium as discussed on the previous page. In order to keep soil fertile and profitable, the plant nutrients removed by either of these ways must be replaced.

Facts about soil testing

The soil test, in itself, is no cure for what ails your land. But it is very helpful in pointing out the nutrients needed by the soil for maximum production and profits. Your DAVCO 3G Agent, using soil test results, can help you to pinpoint the right fertilizer to solve your problem.

How to take a soil sample

The accuracy of the sample will determine the accuracy of the soil test. It is best to use a soil probe or auger, but a garden spade or trowel can be used instead. Make sure the pail you use is perfectly clean.

Each sample should represent 5-10 acres. Divide fields accordingly. Do not sample unusual areas like wet spots, windbreaks, dead furrows, etc. Take at least 15 samples from each 5-10 acre area and place them in a clean pail. If you use a spade, put only the middle of each slice in the pail.

Mix the 15 samples thoroughly. Fill the soil test bag or box and discard the remaining sample. If you use your own container, make sure that it is perfectly clean to avoid contamination of the sample. Clean pail thoroughly before taking sample from next area.

Make sure you fill out the information sheet as completely as you can. Also, make sure your samples are numbered. This way you will know how to treat each area according to the recommendations you receive.

Follow your soil test recommendations!

There is no better guide to better crops and better profits than the soil test. That's why you should always follow its recommendations. After you receive your soil test results and recommendations, study them carefully. Then take them to your DAVCO 3G Agent. His years of experience, his knowledge, as well as the superior product he sells make him highly qualified to work out the fertilizer program for you that best suits the needs of your land.

What about lime?

It is a known fact that when acid soils are treated with lime, the result is measured in bigger crops and profits. The soil test recommendation generally specifies the amount of lime needed if the soil is found to be acid. However, making acid soils alkaline is not the only function of lime. Since one of its basic ingredients is calcium, it supplies this important nutrient to plants (dolomitic limestone also supplies magnesium). It promotes desirable bacterial activity. It improves the structure of heavy soils. And it frees or improves the availability of other important plant foods, such as phosphorus.

When you discuss your soil test recommendations with your DAVCO 3G Agent, he will advise you on the best method of lime application for your specific soil problem.

DAVCO General Cro

Soil tests should be used to determine the an

NORTHEAST REGION

Crop	Situation	Fertilizer Analysis	Rate of Application (lbs. per acre)	Remarks
Corn Sorghums	plow down	0-20-20 10-10-10 15-10-10	500-800	Can be plowed down either in Fall or Spring.
	at planting	5-10-10 8-16-16	200-300	Apply 2" to side and 2" below seed.
	side dressing	nitrogen	60-90 (actual N)	Apply when corn is knee high.
Wheat Oats Barley	at planting	3-12-12 5-10-10 10-10-10 10-20-10	300-400	Apply with drill.
	top dressing	nitrogen	20-30 (actual N)	Top dressing in Spring will generally bring increased yield.
Soybeans	at planting	3-12-12 5-10-10 10-20-20 0-20-20	200-300	Avoid direct contact of fertilizer with the soybean seed.
Alfalfa, Clovers (general)	at planting	5-10-10	700-1000	Inoculate seed, apply fertilizer with borax at seeding.
	top dressing	0-20-20 0-15-30	500-800	Top dress after 2nd cutting.
Pastures	new	5-10-10 8-16-16	500-800	Broadcast and work thoroughly into the soil before seeding. Top dress annually.
	established	10-10-10 15-10-10	800-1000	

NORTH CENTRAL REGION

Crop	Situation	Fertilizer Analysis	Rate of Application (lbs. per acre)	Remarks
Corn, Milo Sorghums	plow down	5-20-20 12-12-12	400-500	Can be plowed down either in Fall or Spring.
	at planting	5-20-20	200-300	Apply 2" to side and 2" below seed.
	side dressing	nitrogen	60-90 (actual N)	Apply when corn is knee high.
Wheat Oats Barley	at planting	6-12-12 5-20-20 12-12-12 16-48-0	300-500	20-30 lbs. of actual N applied as top dressing in the Spring will generally bring top yields.
Soybeans	at planting	5-20-20 0-20-20 0-25-25	200-300	Avoid contact between the fertilizer and soybean seed.
Alfalfa, Clovers (general)	at planting	5-20-20 3-12-12	500-600	Broadcast and work into soil before seeding.
	top dressing	0-20-20 0-25-25	400-500	Apply after 2nd cutting.
Pastures	new	5-20-20	600-800	Broadcast and work thoroughly into soil.
	established	12-12-12	400-500	Top dress annually.

Fertilizer Suggestions*

*These suggestions are based on the experience and reports of customer's results under average conditions.

sis and proper rate of application for a given field.

SOUTH CENTRAL REGION

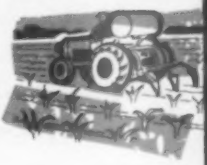
Crop	Situation	Fertilizer Analysis	Rate of Application (lbs. per acre)	Remarks
Corn, Milo Sorghums	plow down	6-12-12 10-10-10	400-500	Plow down in Spring.
	at planting	10-20-20 10-10-10	200-300	Apply 2" to side of seed and 2" below seed.
	side dressing	nitrogen	30-60 (actual N)	Apply when corn is knee high.
Wheat	at planting	6-12-12 5-20-20 12-12-12 16-48-0	300-500	20-30 lbs. of actual N applied as top dressing in the Spring will generally bring top yields.
Cotton	at planting	6-12-12 10-10-10	300-400	30-50 lbs. of actual N as a side dressing will generally prove to be profitable.
Tobacco	burly	6- 6-18 5-10-15S	1000-1500	Row applications if complete fertilizer is used should not exceed 400-500 lbs. per acre unless well mixed with the soil.
Soybeans	at planting	5-20-20 0-20-20	200-300	Fertilizer should not be applied in direct contact with soybean seed.
Alfalfa, Clovers (general)	at planting	3-12-12 5-20-20	800-1000	Apply 20 lbs. of borax with fertilizer.
	top dressing	0-20-20 0-10-20	500-600	Apply after 2nd cutting.
Pastures	new	4-12- 8 6-12-12 10-20-20	800-1000	Broadcast and work into soil before seeding.
	established	10-10-10	400-500	Top dress annually.

SOUTHEAST REGION

Crop	Situation	Fertilizer Analysis	Rate of Application (lbs. per acre)	Remarks
Corn, Milo Sorghums	at planting	4-12-12 4- 8-12 5-10-10	500-800	Extra nitrogen must be side dressed for profitable yields.
	side dressing	nitrogen	50-100 (actual N)	Apply when corn is knee high.
Cotton	at planting	4- 8-12 4-12-12 5-10-10	600-800	30-50 lbs. of actual N as a side dressing will generally prove to be profitable.
Tobacco	flue cured	4- 8-12 4-12-12	800-400	
Soybeans	at planting	3- 9-18 4-12-12	400-500	Inoculate seed—fertilizer should not be applied in direct contact with soybean seed.
Alfalfa, Clovers (general)	at planting	4-12-12	800-1200	Alfalfa fertilizer should also contain 25 lbs. borax per ton.
	top dressing	0-10-20 0-14-14	600-800	Apply after 2nd cutting.
Pastures	new	4-18-12 4-12-12	500-800	If possible plow down before seeding or sprigging.
	established	8- 8- 8	800-1000	Apply in split applications in February and August.

Hints about applying fertilizer

You could safely say that an outstanding fertilizer like DAVCO 3G is only as good as the method by which it is applied. Not only do plants need the right kind and amount of fertilizer, but also, they must have the fertilizer readily available and applied in such a way that germination injury will not occur.



Here are the main methods of applying fertilizer. *Banding along the Row* is recommended for row crops. At planting time the fertilizer should be applied in bands, 2 inches to the side and 2 inches below the seed on one or both sides of the row. *Broadcasting* before or after plowing or by airplane on land too difficult to work otherwise. *Deep Drilling* after plowing is especially good for phosphates. *Plowsoling* under certain conditions can encourage root growth. Other methods are: *Side Dressing, Bedding, Starter Solutions, Top Dressing, Irrigation* and *Foliar Application*.

KEEP IN MIND THAT:

- Even distribution of fertilizer increases efficiency
- Balanced amounts of nutrients, help to produce maximum yields
- The more acid the soil, the more it fixes phosphates
- Nitrates are never fixed in the soil and ammonia only temporarily
- Plants can use some nutrients immediately if sprayed on the leaves
- Generally fertilizer can be broadcast before or after plowing at almost any time during the year

Determine for yourself the most profitable fertilization rates!

As a general rule, soil test recommendations are on the conservative side. Frequently, fertilization rates higher than the ones recommended turn out to be highly profitable. You can find this out for yourself by following the ten steps below.

1. Select a good site which is representative of the field. Plan the plot width so it can be machine harvested easily. Avoid wet spots, alkali spots, dead or gathering furrows and other non-typical areas that may be in the field.

2. Fertilize a minimum of 6 rows in each row crop test plot. It is easier and quicker if these rows run the entire length of the field if possible.

   Leave one plot without fertilizer, apply recommended rate of fertilizer to another. Test two more with amounts greater than recommended. (Such as, one half again as much as normal or double the usual application.)

3. For small grains fertilize a strip at least twice the width of a combine cut. This strip should also run the length of the field where possible.

4. Be sure to mark each location well, so it won't be lost. Mark plots at the time they are fertilized. Use stakes in the rows for row crops—for small grains and forages, use stakes on the fence or in the fence rows. Keep a careful record of amounts of fertilizer put on each plot.

5. Plant test plots the same way as rest of field. Be sure planting rate is adequate to make use of available fertilizer. Apply fertilizer. Fertilize one test strip of at least 6 rows at normal rate of fertilization. Fertilize another test strip of at least 6 rows at half again as much as the normal rate and fertilize another test strip of at least 6 rows at double the normal rate of fertilization.

continued from the preceding page . . .

6 When harvesting, lay out carefully the area to be harvested near the center of the test plot. Also, harvest an area of equal size next to the test plot. This will give you a means of checking results.

7 When harvesting row crops by hand, use table below to calculate length of row you need to harvest to equal 1/100th acre.

For corn, cotton, soybeans, sugar beets and tobacco.

Width of Rows	Amount to Harvest and Weigh
20 in.	2 rows 130.5 ft. side by side
22 in.	2 rows 118.5 ft. side by side
36 in.	2 rows 72.5 ft. side by side
38 in.	2 rows 68.5 ft. side by side
40 in.	2 rows 65.5 ft. side by side
42 in.	2 rows 62.0 ft. side by side

8 When you harvest small grains and flax, be sure that combine is clean. Use table below to determine length of swath according to width of combine. Indicated length will give harvest area of 1/100th acre.

Width of Combine Cut	Harvest 1/100th Acre
42 in.	124 ft.
5 ft.	87 ft.
6 ft.	73 ft.
7 ft.	62 ft.
8 ft.	54 ft.
9 ft.	48 ft.
10 ft.	44 ft.
12 ft.	36.5 ft.

9 Compare yields from test plots with the yields given by the strip you harvested for checking purposes.

10 To find out the extra net return given by each test fertilization, do the following: subtract yield of check strip from yield of test strip and multiply it by value per unit of the particular crop. Then subtract extra cost of applying fertilizer at the rate used on the test plot. Compare the results for each test plot and choose the one giving greatest additional return.

Use these results to eliminate lost acres on your land!

Questions and Answers about Fertilizers

What grades of DAVCO 3G can I get?

Normally, you will find that your DAVCO 3G Agent carries all popular grades of fertilizer. DAVCO is manufactured in the grades and ratios which your State agricultural college has found to be necessary for the soil and crops of this area. Contact your DAVCO 3G Agent and tell him what analysis you need. So that you don't get caught short, it is best to get in touch with your DAVCO 3G Agent well ahead of the time when you will need the fertilizer.

Why does fertilizer help crops in a bad season?

We all realize the importance of weather in securing the best return from crops. Dry weather as well as wet weather is an important factor in crop production.

If your crops have been nourished with a good, balanced ration of plant food, if they received liberal amounts of Nitrogen, Phosphorus and Potash, as well as Calcium, Magnesium and Sulfur, they will be in a stronger, healthier condition to withstand an unfavorable season. In this way they will be able to bring in a good yield, considering the circumstances.

By supplying the necessary plant foods, DAVCO 3G helps you build stronger, healthier plants which will be able to stand up better to unfavorable weather conditions.

Questions and Answers about Fertilizing

What's the best way to store DAVCO 3G?

The *best* way is right in the soil. When you have your soil tested, you find out its deficiencies. Once you know what the soil needs, you should feed the soil to bring it up to its highest level of fertility so that it will grow the crops you want to grow. This feeding can be done between normal growing seasons and puts DAVCO 3G into "active storage" in your soil.

If you prefer, you can store DAVCO 3G in one of your farm buildings. DAVCO 3G has been specially treated to remove free moisture which causes many other fertilizers to be "out of condition" following extended storage. Make sure to keep the bags off the ground, though, and don't pile them more than six high. This way, a ton of DAVCO 3G can be stored in a floor space as small as 6 feet by 3 feet, and will stay smooth flowing and easy drilling whenever you need it.

How long will the effects of fertilizer last?

The left over effects of fertilizer can vary with the type, analysis and rate of fertilizer applied. They can also vary with changes in weather and rainfall on different types of soil. Because of the complex chemical activity going on inside the soil, many plant foods—especially Phosphorus and Potash—will show varying degrees of response the season after which they have been applied.

Extremely heavy applications of fertilizer can last for several years. If a crop has been fertilized but is not harvested and you return it back in the soil, the fertilizer value does not become lost. Newly discovered evidence also points out that there is a much larger carry over of Nitrogen than has been thought before. A good rule to follow in applying fertilizer is to put more into the soil than the crops remove each year and consider the residual effect as an extra, profit-bearing bonus.

Does fertilizer have all the answers?

No. To bring permanent prosperity to your farm, you need to take advantage of all good farming practices. You must establish a long range plan. Be sure to know the importance of established practices like crop rotation; control of erosion; replenishment of organic matter through the use of cover and green manure crops, barnyard manure and crop residues; proper drainage and tillage; and the correction of soil acidity or alkalinity. Practices like these, coupled with a liberal fertilizing program, will bring you greater yields, greater profits from every acre you farm.

What about injuring crops with fertilizer?

When fertilizer is properly applied, crop damage will not occur. In rare instances, as when you improperly apply single element fertilizers, injury may occur. As a general rule, when fertlizer is used on deep rooted crops, it tends to reduce firing during drought because it stimulates root growth. Thus the roots are able to reach down into the soil for more available moisture.

Firing may also be the result of an imbalance in plant foods. That's another reason why so many farmers use a complete, balanced fertilizer like DAVCO 3G.

When is the best time to buy DAVCO 3G?

You should buy and store DAVCO 3G well ahead of the time you plan to use it. It is possible, that during the rush of the planting season shortages develop in certain much wanted analyses. To avoid the rush—and possible disappointment—buy and store DAVCO 3G well ahead of time.

Questions and Answers about Fertilizing

What results can I expect from DAVCO 3G?

DAVCO 3G will help you put life into your *lost acres.* But just what are *lost acres?* The crops—and the profits—you lose when your land isn't up to its highest level of fertility and therefore doesn't produce maximum yields.

Suppose you have 100 acres of soil producing at 80% of their capacity. This means that your land is producing crops that could be produced by just 80 acres . . . and this means that there are 20 *lost acres* on your land. With the use of DAVCO 3G you can get those 20 *lost acres* producing again, and it will be a nice feeling to pocket the profits from an extra 20 acres without buying more land or having to work more land. It's like finding 20 acres you never knew you had.

With DAVCO 3G you can always be sure there will be no *lost acres* on your land.

What is the DAVCO Crop Feeding Program?

The DAVCO Crop Feeding Program is designed to help you make the best possible use of the soil of your own farm. It helps you to take the guesswork out of one of your major cash outlays —the purchase of fertilizer. It provides you with a planned program for your farm, so you can make the most efficient use of your time, money and labor.

Davison has arranged with the Agronomy Department of your State College to assist in designing and planning the crop feeding program for your individual farm. This means that you get an *impartial* scientific evaluation of your fertilizer needs.

The DAVCO Crop Feeding Program operates at no expense to you. Just get in touch with your DAVCO 3G Agent, and he will take the necessary steps to get you into this profitable and helpful program.

The Davison Family of Superior Agricultural Products

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will help you select the right analysis of DAVCO 3G fertilizer for your particular soil problem.

DAVCO 3G is granulated . . . each granule contains the right combination of vital elements needed by your soil. This means that every acre you fertilize is *evenly* fertilized for bigger and better yields. There's an analysis of DAVCO 3G fertilizer for every kind of soil.

For helpful information about fertilizers and how they can help you, detach and keep this booklet, *free* from DAVY DAVCO. For additional copies write: DAVY DAVCO, P.O. Box 2117, Balto., Md.

C★★★

"What Farm Leaders Are Saying..."

Claude R. Wickard, Carroll county, Indiana, corn-hog farmer and former Secretary of Agriculture, recently told members of the Indiana Farm Management Association, "A land retirement program offers the best method of keeping production in balance with effective demand for feed grain and livestock. Midwestern farmers can have an effective land retirement program if they will unite and ask for, and support such a program. The programs written in Washington are the result of the demand of the people."

• • •

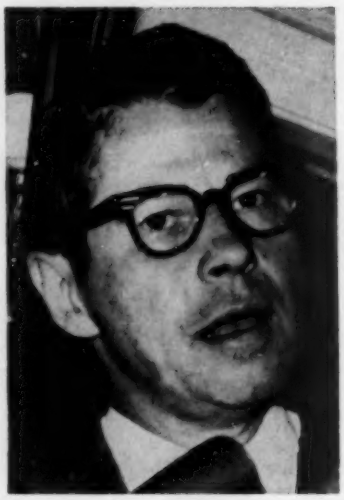
Paul Johnson, editor of Prairie Farmer, told the same group, "If the great corporations in the food field ever move into agriculture on a big scale in the future, it will be a matter of practical procurement. Above all, we need to produce the kind of product that is needed and wanted, and deliver that product in the quantity and quality and at the time it is needed.

• • •

Robert S. Boal, farm management specialist at North Carolina State College, says, "No amount of complaining will ever change the fact that farmers are competing against farmers. Investigation usually shows that a lower price or lost market has been brought on by competition from farmers in other areas. These other farmers have been willing to supply higher quality, take lower prices, or give more services. Farmers who wish to secure dependable outlets need to increase their market power.

• • •

If farmers hadn't changed their methods of production, and hence, not improved their yields in the last 35 years, it would cost two dollars to raise a bushel of corn today instead of 90 cents. Making these calculations, **R. H. Blosser** of the Ohio Agricultural Experiment Station said, "Using the old methods of farming, it took 35 hours of labor to produce an acre of corn, whereas now, labor requirements are only about 6½ hours per acre. Yields then averaged 40 bushels, but now they are 65 bushels per acre.



Secretary of Agriculture **Orville Freeman** told farm organization leaders, "Only recently a Gallup Poll revealed that the most frequent complaint on the part of the general public was concern about the increased cost of food; yet the fact is that costs of rent, medical care and transportation have increased twice as much as that of food during the past 10 years.

"The relatively slight rise in food costs has been one of the principal non-inflationary aspects in our economy in recent years. If the prices received by farmers had increased in proportion to other prices, and if such increases had been passed on to consumers, Americans would pay billions of dollars more each year for food and clothing. And thus, in a very real sense all consumers have gained.

• • •

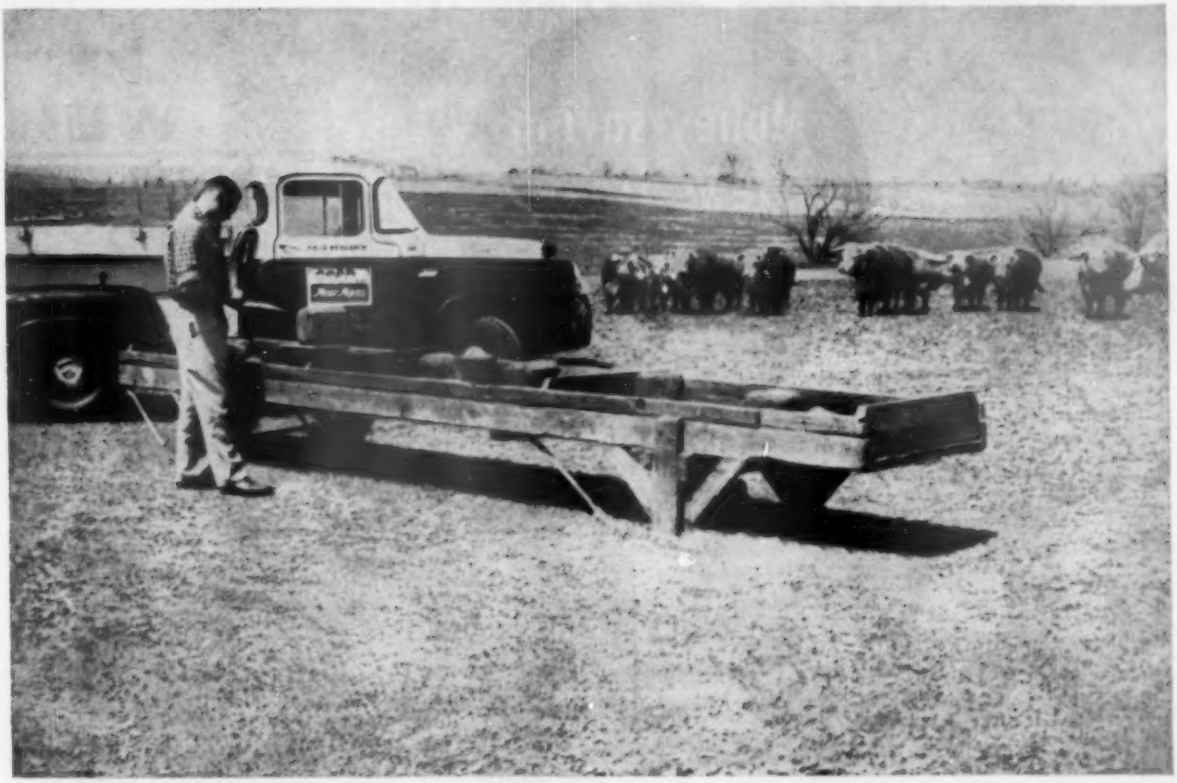
Dr. George L. Mehren, director of the University of California's Giannini Foundation of Agricultural Economics recently said, "The American farm and food economies have changed drastically in the last 30 years, leading to elimination of the old open-market system and requiring production of foods oriented to market demands. Many farmer marketing cooperatives must now determine in advance the wants of their customers and then simultaneously program procurement, production and merchandising to deliver the required product under the desired terms. To achieve these new goals, some farmer cooperatives must change their methods.

• • •

T. A. Hieronymus, University of Illinois agricultural marketing specialist, urges, "Farmers should not lose sight of the importance of market size and preferences when recommending farm policies and programs. Efforts to aid and adjust agriculture must be made within the available markets. To expand the market for food, the market must supply what consumers want to buy. Price differences must be established so that producers will be encouraged to produce high-quality products in large volume to meet consumer demand.

• • •

L. Y. Ballentine, North Carolina Commissioner of Agriculture, recently stated, " . . . this technological age has narrowed understanding between people of all walks of life. And there is less public knowledge and understanding of farming than of any other profession — or, what is worse, more widespread misinformation and misunderstanding about it. To the man in the street, farming is one of the last of the unskilled occupations involving no more investment than the farmer's elbow grease; and the farmer is merely an economic problem — a beggar with one hand in the public till and the other in the consumer's pocket — a creator of surpluses which must be bought with the taxpayer's money to keep high the taxpayer's cost of living."



MoorMan's Field Research— the third step to feeding profits

Field Research at MoorMan's is the third step in testing a feed concentrate that will help you produce more low-cost meat, milk and eggs.

Experiments in the MoorMan Laboratories come first . . . then, tests on farm animals at one of the three MoorMan Research Farms that total 1,280 acres. If these prove satisfactory, the MoorMan Field Research Team takes over. They check the adaptability and performance of a product under ordinary conditions on *hundreds* of MoorMan customer farms and ranches.

Take Vitamin A in Blocks. First experiments showed the desirability of adding it, when and where needed. Recent field research has shown it desirable that *all* Blocks have Vitamin A. So, low-level Vitamin A is a *standard ingredient* in all 10 different Mintrate Blocks.

Through observations in the field, they also make recommendations for improvement in present feeds, new forms and even new feeds.

So, *Field Research* is one of the *reasons* behind the high quality and dependability of MoorMan's Mintrates. Fully tested and proven Mintrates are your assurance that livestock and poultry get the necessary vitamins, minerals, proteins and antibiotics they need for fast, low-cost production.

A sharp pencil and accurate records are important tools of the researcher. They help to tell him the results. They help show him the way to improvement. These same tools are important on the farm or ranch. They help you plan your future programs and figure your profits.

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NEW BOOKS

AGRICULTURAL FINANCE, published by Iowa State University Press, Press Building, Ames, Iowa.

AUTHORS: William G. Murray, Professor of Economics, Iowa State University, and Aaron G. Nelson, Professor of Agricultural Economics, University of Arizona. PUBLICATION DATE: 1960. DATA: Fourth edition, cloth bound, 486 pages. PRICE: $6.50.

Complete revised and up-dated revision of this standard reference on agricultural finance and credit. Part I discusses the principles and procedures involved in obtaining and granting farm credit. Shows both the farmer and the lender how credit can be used profitably and safely. Explains the terminology and common practices in credit extension. Part II analyzes the various types of lending agencies and the role they play in agricultural financing. Appendixes cover loan applications and procedures involved in buying a farm.

PROBLEMS AND POLICIES OF AMERICAN AGRICULTURE, published by Iowa State University Press, Press Building, Ames, Iowa.

AUTHORED BY: The Center for Agricultural and Economic Adjustment, Iowa State University. PUBLICATION DATE: 1959. DATA: First edition, cloth bound, 460 pages. PRICE: $3.95.

The papers of 25 leading agricultural experts discussing the nature, cause, and possible solutions of the major problems of commercial agriculture, are brought together in this book. They present summaries of findings from individual research and suggest new ideas or hypotheses to be discussed and examined. The papers are structured to get at the broad and basic problems which face agriculture in meshing its development with that of a growing and mature economy. The book is an outgrowth of a symposium held by the Center for Agricultural and Economic Adjustment, Iowa State University, which was established to serve the needs of agriculture in Iowa and the nation.

DENISTON "LEAD-SEAL" Metal Roofing Nails

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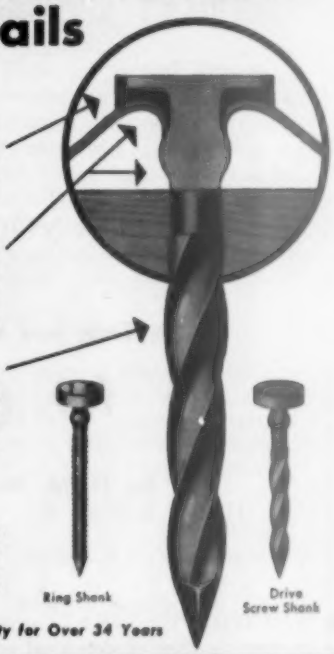

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DO YOU BELONG TO AN ORGANIZATION?

Then you should know this FORMULA for GROUP SUCCESS

by D. M. Hall, Associate Professor, College of Agriculture, University of Illinois

● WHETHER WE LIKE IT or not, most of us belong to an organization of one kind or another. Some are good. Some are bad.

Why? What makes the difference in groups that really get something accomplished and ones that seem to get nowhere?

What will determine the success of your own farm organizations?

Group success isn't something that comes from people just meeting together. It takes the right kind of people in the right places for success.

The Formula For Success

The success of any group depends on how well members can regulate their group life and achieve the goals the members agree are worthwhile. There is a formula for this — A R C O = SUCCESS.

Atmosphere is the "A" in the formula. A group will fail unless its atmosphere permits its members to develop. There are three kinds of atmosphere — autocracy, laissez faire, and democracy.

Autocracy is the atmosphere where the leader and his henchmen either crack the whip or "butter members up" to make them do their bidding. Dominators rule for their own benefits; they determine policies and procedures and pass out the rewards and punishments without reason or explanation. Members never know what to expect — except that they will be bossed. They dominate, group members submit.

A second type of atmosphere is **laissez faire.** In this type, everyone looks out for himself. There is no organization, no program, no leadership. To rescue itself from this confusion, a group usually calls on an autocrat with unlimited powers to bring order out of chaos.

Desire Democratic Atmosphere

The third type of atmosphere — **democracy — is the** one desired by most. All policies and procedures are discussed, criticisms are invited and the group makes its own decisions. It may decide to delegate certain functions but retains the right to take away the authority that it delegated. In a democratic atmosphere members receive individual consideration. They have rights and responsibilities. They are free to make decisions, but are held responsible for their actions.

The "R" in the ARCO formula stands for "roles." People are not born with "roles." They learn them from their parents, teachers, and from their successes or failures. Each person assumes a role he thinks suitable. Roles are roughly classed as group-destroying, group-dependent, and group-building.

Briefly, the immature, aggressive, self-seeking individual plays group-destroying roles. Lacking the physical force to dominate, the aggressive person submits and assumes a group-dependent role. The dependent person needs continuous reassurance. He is carried along by the group and tends to capitalize upon helplessness. If this person doesn't receive support, he drifts away, becoming indifferent and detached.

If a group is to succeed, group-destroying and group-dependent roles must be discouraged, group building roles encouraged.

A group-builder is a frank, sincere, considerate person with the warmth of feeling and firmness of purpose, who knows how and expects others to cooperate with group members in achieving the group's purposes.

Group Has Two Aims

Groups aim to do two things: 1. Solve their problems speedily, and 2. receive satisfaction from meeting together.

To solve a problem, two roles must be played. The facilitator is the fact giver, the specialist, the expeditor, the summarizer or the resource leader. Unless the group has "good facts," it cannot reach "good" solutions.

The **orientor** provides guidance for the group. He seeks to have the group answer three questions: "Where are we headed?", "How are we going to get where we

want to go?", and "Who is going to help?". This forces the group to inventory each member's skills and abilities.

But a group must do more than solve problems. It must find satisfaction in meeting and this demands that a third role be played — the **encourager-harmonizer.** This takes a warm, friendly fellow who likes and likes to be liked. This person provides no good facts or guidance; he provides only fun.

The encourager-harmonizer accepts you as you are and does not expect you to change. The orientor and facilitator are the irritants and expect you to change and accept new goals.

The successful group usually has a facilitator or orientor as president. But because the encourager-harmonizer is popular, he can be elected if he wants to be. Should he be elected, the group is likely to turn out to be a "do-nothing" group.

The "C" in the formula means the right combination of persons. A group will fail if it is not composed of the right combination of persons. It's not the persons who are right or wrong, but the combination. A gang is the right combination of the wrong kind of persons.

A group formed only from persons who think alike has little chance of succeeding. Progress is built upon differences. Of course, we need a certain similarity in interests and attitudes to get people together. But we also need distinct differences in abilities and skills. Unless we cultivate differences, unless we encourage the attitude to examine and criticize and discourage loyalty identified only with obedience, we can have no progress. The membership committee has a large responsibility for group success in that it is expected to get together the right combination of persons.

Nine Group Functions

The "O" in the formula means organization. A group must build an organization and make it function in nine ways. Here are those functions:

1. Recruitment to obtain the right combination of persons; 2. making rules; 3. efficient and prompt action; 4. delegation of responsibilities and leadership authority; 5. education; 6. problem solving; 7. evaluation; 8. rec-

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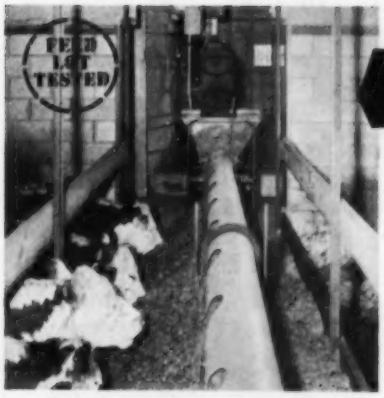

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reation; and 9. organization.

Two types of groups are identified — membership and reference groups. Each has a special sphere or operation.

Membership groups provide the satisfaction for our more personal problems. Some examples are families, clubs, gangs, work and study groups. These are usually small closely knit groups based upon common interest which are very influential in creating attitudes and in formulating behavior patterns.

Reference groups are those larger associations that we join more or less inactively. We accept the ideas of the majority and go along with the action of the directors with some degree of feeling but without much participation. Examples are farm organizations, political parties, trade associations, labor unions, country clubs, and others.

Our contact with reference groups is mainly through representatives. This promotes an agency type program, usually dominated by an inner circle. Leadership talents in these groups are those of developing working compromises and in controlling dependent minorities. These groups fail when the leaders do not ask for domestic participation. Too often the leaders seize the authority and then build public and member relations programs to convince all others that the "inner circle" is infallible and powerful.

Knowing the formula is not enough. There are facts to teach and procedures to demonstrate the values of the various atmospheres. There are leadership skills to achieve. We have prepared questionnaires which permit a group to uncover its problems and purposes and forms which help a group select the right combination of persons. We have tests which enable us to identify the most suitable leader candidates. These are explained in my new book "The Dynamics of Group Action" but some of these devices will need to be administered by a resource leader. Every group needs the counsel of a resource leader, and training resource leaders is a small price to pay to achieve and perpetuate our democracy. End

FIVE FORMER SECRETARIES: Left to right, Henry A. Wallace, 1933-1940; Claude R. Wickard, 1940-1945; Clinton P. Anderson, 1945-1948; Charles Brannan, 1948-1953, and Ezra T. Benson, 1953-1960.

Five former Secretaries look at

Agriculture In An Uneasy World

● FIVE MEN OF PROMINENCE in agriculture, all with the same assignment, went to the podium. Michigan farmers listened intently as each told — in twelve minutes — the philosophies which guided him during his term as Secretary of Agriculture.

The occasion: Michigan Farmer's Week. The topic: Agriculture in an uneasy world.

One hour. That's how long it took to recall 28 hectic years in the history of American agriculture. These men, each answering the same three questions, reflected views as different as the programs they supported during their years as unofficial captain of the nation's biggest business team.

Here are the questions asked each of the former secretaries:

1. **Why does a Secretary of Agriculture do the things he does?**

2. **What changes have taken place in agriculture since your term as Secretary?**

3. **Looking ahead for the next decade, what should we do, taking into account the national and international problems and pressures that are likely to influence policy actions?**

In this report, answers to question No. 2 have been omitted. Obviously, each told about progress in technology, agricultural abundance, trends toward fewer and larger farms, etc.

Here are the former Secretaries answers to questions 1 and 3 above:

BENSON: . . . Let me say that I believe all of us as Secretaries acted in what we sincerely felt was the best interest of agriculture and the whole nation. Well-intentioned men reach different solutions — make different decisions — not because they lack sincerity, but because different backgrounds and different philosophies lead them to see facts in different lights.

My own actions stemmed from a basic philosophy which I expressed in a statement of principles a few days after becoming Secretary. I believe firmly that our freedom is a God-given blessing, vouchsafed to us under the Constitution — that it is more precious than life itself — and that it must be continually guarded, lest we lose it to Big Government.

I believe that the primary objective of agriculture is to provide consumers with high quality food and fiber *at prices that give farmers a fair and steady return in the market place.*

I believe that the sound method of achieving this objective is not through government price fixing but through adequate programs of research, education, and market development.

I believe that price supports can be a valuable tool for the farmer if properly used and not abused. Their original purpose was and still is good — a device to facilitate orderly marketing. Their improper use results in loss of markets, the accumulation of surpluses in government warehouses, and high costs to the taxpayers.

I believe that government should strive to help the individual and the group to help themselves, rather than to try to legislate prosperity for them.

(*Continued on page* 28)

TEXAS "SCATTERED AGENTS"

● THE CURRENT COST-PRICE squeeze is doing more than raising a howl from distressed farmers across the country—it's bringing a quiet revolution among the ranks of the nation's corps of professional farm advisers.

Farmers, pinched by rising costs, are asking questions which the professional adviser is not able to answer. They're tough questions—management questions. And they want answers.

Extension services across the country are busy trying to figure how to prepare their county agents with answers to these increasingly difficult management questions.

Texas, for example, has met the problem with a system of area management specialists.

"Management is now the key to successful farming," Director John E. Hutchison said as he inaugurated the Texas method of area farm management specialists. "The rewards for good management have never been greater nor the penalties for mistakes more severe than they are today."

While management has always been important, and some farmers always stood out because of their superior ability to handle man power and tools, hard manual labor was the important thing in the early days. The poor manager could make up the difference by working harder.

In postwar years, the pressure began to mount for sound management practices. Although farmers and ranchmen were producing record highs, their profits were shrinking. "Here upon us was a generation unprepared for such complex skills as income tax management, large scale credit, farm bookkeeping and accounting, and enterprise budgeting," the Director observed.

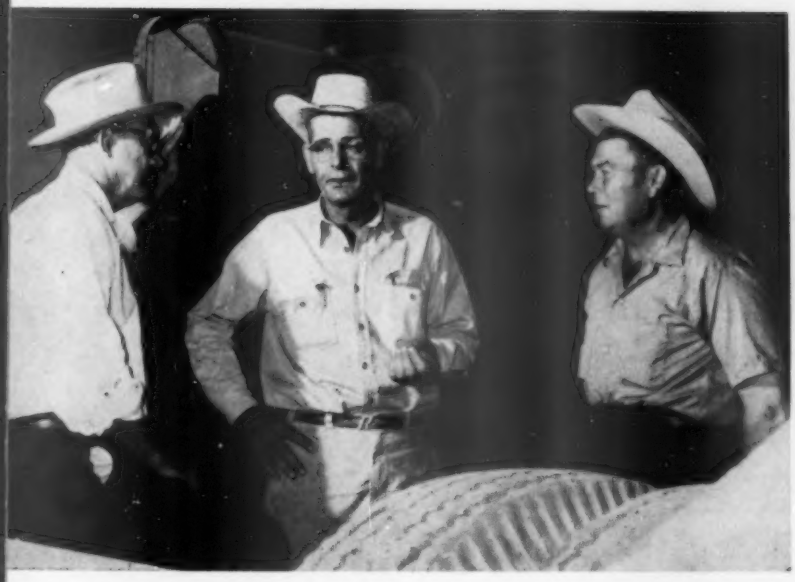
Pilot Project Started

As early as 1953, Texas Agricultural Extension set up a pilot project in farm management in Navarro county. So successful was this attempt, a statewide service was set up using a method known as farm and home development.

Look at some of the figures developed from farm and ranch record books: Increase in 1957 in net cash farm income of $935 over 1956. In 1958, 1,373 families showed an average increase in net farm income of $1,625 over 1957.

This was excellent for a limited number of Texas farm and ranch families. But how could this method be carried to great numbers of Texas families? State Extension resources were limited and there simply was not enough personnel available, it seemed, for this gigantic task to be feasible.

Two steps were taken that will carry the farm and home management approach to thousands of rural families: (1) Every agricultural and home agent has received special training in management. (2) An agent in farm management and an agent in home management have been



Rayburn Allgood (center) is facing a problem of sufficient grazing for his cattle in far West Texas. Charley Taylor, area farm management specialist (left), and E. J. Harrison (right), discuss the prospects with Allgood.

F. N. Boone, Palo Pinto county Angora goat raiser, knows it takes good management to make a living on a small, 1,000-acre ranch in the Texas brush country.

by A. B. Kennerly

SOLVE TOUGH PROBLEM

appointed for each of the 12 districts of the state. These agents, operating from district offices, conduct a continuous training program on management principles with the county agents in each district.

Success In Two Years

Not quite two years have elapsed since the first area farm management specialists took to the field. But their work is already effective.

Robert H. Kensing, a specialist who works in a 22-county district in the sheep and goat region of Texas says, "When a producer seeks help from the agent on problems of records, planning, cost of production figures, or taxes, the specialist and the county agent go directly to the farm or ranch to assist the producer with his problems. They help the producer set up an accounting system and budgets that will provide him with the information he needs."

Work With Demonstrators

Area specialists often cooperate with county agents when they compile and evaluate data from result demonstrations. "In many instances, the economic evaluation shows more dramatic differences than the yield differences might indicate," Kensing points out. "Also, the economic information actually strengthens any recommendations based on the tests the agent may choose to make. The specialist has ample opportunity to relieve the pressure on agents who are faced with questions on management problems."

County agents like the new method of specialists assigned to work in the districts. Texas, with its 254 counties — some as large as whole states — cannot be efficiently covered by the state specialists. "We can obtain assistance in farm management practices at a much faster pace," says County Agent Hollis Duke at Atascosa county.

"Since farming in West Texas is highly specialized, the farmer wants his information direct as problems arise," says W. T. Posey, county agent at Fort Stockton. "The area farm management specialist, quickly available for consultation, gives us an extra assist in putting over the entire Extension program."

Income Tax Training

Joe Johnson, area farm management specialist in South Texas, says discussions at income tax meetings indicated farmers are discovering allowable tax deductions they have been overlooking for years.

Training in income tax matters has been especially helpful to farmers. Doug Smith, county agent for Ochiltree county, related after a meeting where 70 farmers and ranchers attended, "There were farmers at this

(*Continued on page* 26)

AGRICULTURE in the ATOMIC AGE

by **Alvin L. Bertrand and Louis L. Rusoff,** Louisiana State University

● SINCE THE SIX-SHOOTER, barbed wire, and the windmill paved the way for settlement of the West, this country has been engulfed in a wave of inventive genius such as never before witnessed in the history of man.

Although most of us probably don't realize it, inventions nearly always result in radical changes in our way of life. Years ago, this change was slow. It took man 100,000 years to move from the Stone Age to the Bronze Age. Man, again moving slowly, required 1,600 years to move from the Bronze Age to the Iron Age. But slow as they were, these technical changes made vast differences in the life of man.

As time passed, innovations came at a faster clip. We might prove this point by looking at agricultural technology during the past 2,000 years.

First, there was the Modern Craft Age lasting 830 years — from 1,000 to 1830. During this era we saw lavish use of human and animal power, hand wrought tools, and little indirect communication.

Then came the Machine Age, which began in 1830 and ended in 1920 — a period of only 90 years. During this time, multiple and tandem hitches, steam power, machine-wrought tools, specialized farming and the telephone and telegraph came into use.

The third period, the Power Age, lasted only 40 years — from 1920 to 1960. Changes during this period included extensive use of gasoline and electric power, self-propelled machines, radar and television.

Now — The Atomic Age

Now we are entering a new era — the Atomic Age. How long will it last? What will it mean to those of us in agriculture?

It could well mean that we will see more changes in the next ten years than we have seen in the previous 2,000! This may be hard for us to believe, it's true, but the evidence points that way. The last 150 years brought just about all the changes significant to present-day agriculture. The iron plow came in 1806, the reaper in 1831, the cornplanter in 1853, the combine in 1905, and rural electrification in 1935; to mention a few items.

Atomic Energy in Agriculture

Now let us take a look at some of the agricultural uses to which nuclear energy has been put and then speculate on what might be in store for the future.

Research with radiosotopes, the by-products of nuclear fission, is the key being used by agricultural scientists to unlock nature's secrets concerning the biological processes of plants and animals. Radiosotopes are used in two ways: (1) as "tracers" in following the path of nutrients and chemicals through the bodies of plants and animals, (2) as sources of high intensity radiation to cause mutations and to kill certain microrganisms and insects.

Tracer Technique

The tracer technique is possible because atoms "tagged" or labeled to make them radioactive behave in the plant or animal body exactly as do normal elements. These atoms emit radiations which make it possible for their paths through plants and animals to be followed. The great research potential of this technique is seen in the fact that one hundred millionth of an ounce of radioactive material can be detected after it has been distributed in a cow weighing 1000 pounds.

Although "tracer" research is still in its infancy, this approach has already been used to provide many answers of great significance to farmers. Investigators have used tracer elements to study the efficiency of various types of fertilizers and to determine the best time, method, and depth to apply plant nutrients.

Provide Practical Information

Tracer elements were used to ascertain conclusively that plants absorb nutrients through their foliage, fruit, flowers, and twigs, as well as their roots. Such studies have also indicated the best stage in the life cycle of a

"If the 'atomic age' turns out to be the 'giant step' in agriculture we believe it will, many dramatic changes may be expected. First of all, a phenomenally more efficient agriculture appears certain. We can expect farm management practices to be revamped; credit needs and uses will change; new kinds of facilities will be needed; new skills and techniques will have to be learned; programs of conservation, crop control, subsidy, and tariff will have to be adjusted."

plant to apply a fertilizer, and whether a rapidly acting or a slowly acting fertilizer is best for a particular plant. Studies now in progress are designed to shed light on other problems related to plants, such as what causes earlier maturation, how yields may be increased and how fruit may be prevented from dropping to the ground prematurely.

In the short time that radioactive materials have been available for research use, great strides in the control of plant diseases and pests, (both insects and fungi), have been made. Procedures and products to curb such conditions as peeling, wilt, scab, root rot, and other disfiguring disorders are the direct result of this work.

Fight Farm Diseases

A great many insects that harm farm crops and animals or carry disease have been "tagged" with various radiosotopes so that information helpful in developing effective means of control might be obtained. In one example, a minute piece of wire of radioactive materials was placed on a cut worm and its movements followed everywhere, even through several inches of soil.

In animal research, feeds of various types have been "tagged" and their digestion, absorption, metabolism and excretion pathways studied. To illustrate, one investigation determined that 70 per cent of the calcium in hen eggs comes directly from what the hen eats while the remainder comes from the bird's tissues. Radioactive materials have also been used to study red blood cell formation and diseases of animals such as anemia.

Radiation Techniques

Radiation techniques offer a second way in which nuclear energy may be used in agriculture. Plants are exposed to radioactive materials in order to "tailor" them to meet specific demands. "Radiation genetics" have been used in the development of new strains of hardy, disease-resistant and higher yielding crops in an unbelievably short time. **In one experiment, a new variety of oats was obtained in 18 months. Conventional methods of research might have taken ten years or more to develop the same strain.**

In another example, radiation techniques produced a new strain of peanuts characterized by a yield of about 30 per cent more per acre, better leafspot resistance and a shape and size better adapted to mechanical harvesting in record time.

Not so long ago, the person suggesting that an insect might be exterminated through sterilization would have been the laughing stock of the nation. Today, nuclear energy, in the form of radiation, has been used successfully in the eradication of the screw worm fly in a limited area.

The experiments with ionizing radiation to preserve perishable foods have been so highly publicized, there is no need to go into detail here. These investigations prove that dairy products, fish, eggs, vegetables, and fruit can be kept for longer periods of time without refrigeration after being irradiated.

These are but a few of the many dramatic ways in which nuclear energy has already been used in the solution of agricultural problems.

Will Atomic Agriculture Be Accepted?

The preceding discussion serves the purpose of demonstrating how atomic energy might be used in the future development of agriculture. There is, of course, no way of knowing ahead of time how new ways and products will be accepted. Farmers, as others, carefully evaluate innovations from a number of different standpoints before they accept them.

Sometimes, the new ways are not adopted because they conflict with old ideas which are deeply held. Iron plows were rejected by some at first because it was thought they would poison the soil. The inventor of anesthesia, Dr. W. T. G. Morton, was hailed as a "decoy in the

hands of Satan" because it was believed man was born to suffer.

New practices also may be rejected because of the cost factor. The farmer who has a heavy investment in machinery and equipment which would become obsolete with the adoption of new practices, will hesitate to make a change. Also, persons who sell and service the "old" equipment may be against change. The cry of the wagon and buggy manufacturers that the gasoline fumes of automobiles would kill everyone are not so far in the past as to be forgotten.

We Resist Change

Other sociological and socio-psychological factors are always present in change and help explain the reticence of farmers in the adoption of new practices and procedures. These factors are operative at two levels. In the first instance the farmer may not make changes because of conservativeness or fear of the unknown. The statements "It was good enough for my father, so it's good enough for me," and "It may be all right for some people, but not for me," are typical reactions.

At the second level, new products may be resisted because of actual or fancied notions regarding taste and quality. Many southern farmers did not adopt hybrid corn at first because they were convinced it made an inferior corn bread.

Changes Will Come

Despite the above factors, it is the thesis of this article that far-reaching changes will come to agriculture as a result of the use of nuclear energy. We base this assumption on three strong forces which they believe will promote rapid acceptance.

- First, the economic rewards forthcoming from "atomic" agriculture will be so great that the individual commercial farmers will have little choice in the matter of acceptance. Those farmers who lag behind will be mercilessly eliminated because of inefficiency.
- Second, the cost of developing "atomic" agriculture will not be exorbitantly high for the average farmer. Research and development in this area, because of its dangerous and costly nature, must necessarily be done by professional and highly skilled persons. Since most of these researchers are in colleges, universities, and government places, farmers will bear little of the developmental costs directly. They will benefit from the end result of the work in the sense of getting better seed and strains; and being shown more efficient ways of applying fertilizer, insecticides, etc.; and learning better ways of preparing and feeding nutrients to livestock and poultry.
- Third, the farm people of the U. S. are becoming more and more conditioned to change. New ways have come so fast in the past few years, that they have become a matter of course, especially to commercial farmers. In fact, in some communities the slow adopter suffers in prestige as well as inefficiency.

If the "atomic age" turns out to be the "giant step" in agriculture that we believe it will, many dramatic changes may be expected. The emerging cyclorama will leave nothing sacred. One can only speculate on the nature of these changes, but developments to date provide clues as to what might be in store.

First of all, a phenomenally more efficient agriculture appears certain. This cannot help but come about as agricultural problems are solved more quickly and effectively. The cost of power, long a thorn in the farmer's side, will cheapen greatly, if nuclear energy devices now being experimented with are successful. What this will mean in terms of greater efficiency is almost beyond the imagination.

Three Types of Change

Greater efficiency in farming will in turn trigger a whole host of other changes. These will be of at least three types.

The first type of change will occur and be evident at the individual farm level. Here, one may envision, among other things, that: farm management practices will have to be revamped; credit needs and uses will change; different types and kinds of facilities, such as barns and storage places, will be needed; new skills and techniques will have to be learned, and old established procedures relating to buying and selling will be outmoded.

The second type of change will be at the government level. Programs of credit, conservation, crop control, subsidy and tariff will have to be adjusted to fit increased productivity. Regulations regarding marketing procedures and processes will also require face lifting, with the international picture playing a more prominent part than in the past.

County agents and other agricultural workers of the future will have a more highly professionalized client on a larger and probably more specialized farm. These clients will be more demanding of up-to-the-minute information and will be more business-like in their contacts. Agencies which cannot or will not change to meet these demands will fade out of the picture.

Change Will Accelerate

The use of nuclear energy in agriculture will accelerate social changes now in process. All the important functions of the rural community — health, education, religion, welfare, etc. — can be expected to migrate to "trade center" towns at an increasing rate. At the same time, the levels of living of farm families, will certainly improve — probably to the point that rural and urban differentials in the use of electricity, televisions, telephones, mechanical refrigeration and the like will be hard to detect.

The above serve to illustrate some of the changes which may be expected as we move into an "atomic" era in agriculture. These changes will not come about without some uncertainties and tensions. We must gird ourselves psychologically and resource wise for the pressures and problems to come. If we plan wisely, our nation's agriculture will enjoy an efficiency and prosperity the likes of which have never been witnessed before. End

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smartweed	brome grass	stinkgrass	knotweed
barnyard grass	foxtail	wild oats	wild buckwheat
crabgrass	old witch grass	carpetweed	

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WASHINGTON NEWS

by Jay Richter

The big conference of farm organization leaders in Washington taught Freeman that his decisions will be backed by National Grange and Farmers' Union, and opposed by Farm Bureau — a fact that was already clear.

New Chief No Stranger

The new chief of the USDA agency group which includes research, conservation, and extension activities is no stranger to most key men in the fields he'll be handling.

Dr. Frank J. Welch, 58-year-old Dean of the School of Agriculture at the University of Kentucky, left that post when the Kennedy administration took office to become Assistant Secretary of Agriculture in charge of Federal-State Relations agencies.

Welch has been close to the Rural Development Program in recent years, and has been a member of many public commissions and advisory and study groups in agriculture.

The makeup of the rest of the USDA top command, heavily larded with Southerners, gives **Agriculture Secretary Orville L. Freeman** a group of aides who can be counted on to lean heavily toward programs aimed at marketing control and higher farm prices.

One example was the choice of 34-year-old **Dr. James Ralph,** only recently named Director of the California State Department of Agriculture, as new Assistant Secretary of Agriculture in charge of production and price stabilization. Ralph, who has studied and taught at Middle Tennessee State College, Iowa State, Stanford, and Kentucky, is a strong advocate of farmer-run marketing control programs.

Other USDA appointments include: **John Duncan, Jr.** (president of the Georgia Farm Bureau) — he'll head up Agricultural Marketing Service and Foreign Agricultural Service; Chairman of the Department of Agriculture National Advisory Commission, **Harry Caldwell** (master of the North Carolina State Grange). **John Baker** is the new Director of Agricultural Credit Services. He has been director of legislative service for the National Farmers Union. **Horace Godfrey** is Administrator of the Commodity Stabilization Service. He headed the North Carolina Agricultural Stabilization and Credit Office. **Dr. Willard W. Cochrane** of the University of Minnesota is Staff Advisor on Economic Affairs to Secretary Freeman.

No Agreement — Yet

That big conference of farm organization leaders which met in Washington in late January didn't get much done.

A half-day of talk produced agreement that there's too much land in production these days, that farmers ought to have more bargaining power, and that farm income should be higher.

But when it came to methods of solving the problems on hand, the conference broke down into the old familiar divisions. The American Farm Bureau Federation's policy remains as far as ever from the policies of the other major general farm groups and some of the important commodity organizations.

If the meeting accomplished anything, it taught Freeman and his new aides that **most of their major decisions will be backed by the National Grange and National Farmers Union, and opposed by Farm Bureau — a fact that has been clear for a long time anyway.**

Expand Food Donations

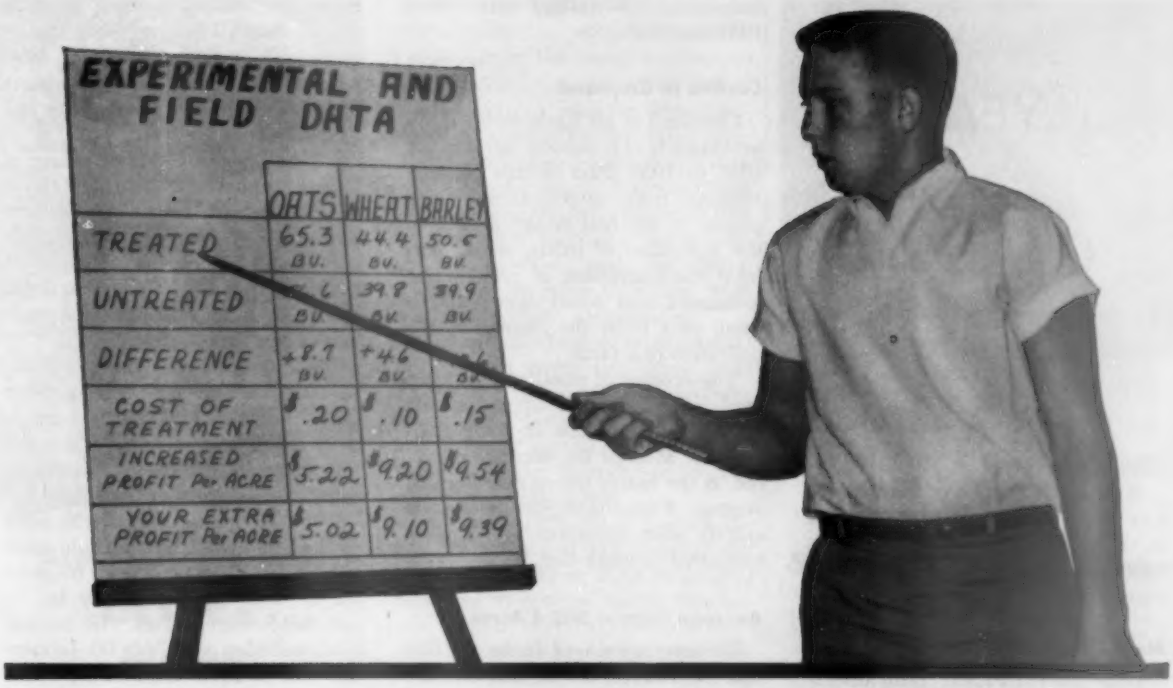
One key principle guiding the new administration in agriculture is the importance of tying farm policy to overall national needs.

How this works in practice was demonstrated by the fact that before moving on any farm production or price programs, the new team got busy on a fast-moving series of food donation operations.

Only after those moves were underway or announced did Freeman begin to officially unveil new proposals for boosting grain supports and reducing production. Bills dealing with the grain problem were in the final stages of preparation at press-time.

It's worth noting that not all Democrats are enthusiastic about the idea of higher grain prices.

"I wish our county agent would drop by — I haven't had a good game of horse-shoes in months."



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"Best way I know to put $25,000 of extra spending money into my home county would be to treat all the small grain seed with a good seed treatment," says Danny Lamb, Swainsboro, Ga., winner of the 1960 Georgia Crop Improvement Project Award.

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YEARS OF CHANGE

Continued from page 9

1930 in the South.

A larger proportion of farm operators owned all or part of their farms in 1959 than at any census since 1880, the first census for which this information is available.

More Farm Renters

With mechanization, farm operators have been enlarging the size of their farms. One of the methods of increasing the size of farm operations is the renting of additional land. In 1959, farm operators renting land in addition to the land they owned totaled 809,600. The number of farm operators renting additional land has almost doubled since 1900. (See Table 6)

Notwithstanding the decrease of 23 percent in the number of farms, land in farms declined approximately 38 million acres or 3 percent during the last five years. (See Table 7)

About two-thirds of the decline in land in farms occurred in the 16 Southern states and one-third in the 21 Northern states. Approximately 6 million of the 38 million acre decrease in land in farms resulted from the change in the definition of a farm.

Part of the decrease in land in farms resulted from whole farms being taken completely out of agricultural production and placed in the Soil Bank. Some of the decrease resulted from the expansion of urban areas. Both factories and homes have been moving from cities to rural areas. New highways are taking land out of agricultural uses.

In the 345 counties making up standard metropolitan statistical areas, the number of farms decreased 187,000 or 28 percent; land in farms, 7 million acres; and cropland harvested, 2.5 million acres from 1954 to 1959.

Decline in Cropland

Cropland of all kinds declined approximately 11 million acres from 1954 to 1959. Part of this decrease resulted from whole farms being placed in the Soil Bank; part from the expansion of urban areas; part from the conversion of cropland to woodland and forest land; and a small part from the change in the definition of a farm.

The acreage of woodland in farms used for pasture was approximately 29 million acres less in 1959 than in 1954. Most of the decrease occurred in the South where considerable acreage of woodland pasture of poor quality were taken out of farms or converted to other uses.

Average Farm — 302.4 Acres

The average size of farms in 1959 was 302.4 acres, the highest average size shown by any farm census. (See Table 2)

The average size of farm has doubled during the last 35 years. The change in average size of farm during the last five years was greater than that during any five-year census period or any 10-year census period prior to 1954.

Farm Value Up

The average value per acre of farm land and buildings in 1959 was $121. In the five-year period, average value of land and buildings per acre increased 44 percent. This increase was greater than for any five-year period since 1920, except for the period 1945-1950. The average value of land and buildings per farm in 1959 was $33,242, an increase of 63 percent over the average for 1954.

The average value of land and buildings per farm is now 2½ times the average for 1950 and 6 times the average for 1940. (See Table 8)

More Older Farmers

In 1959, 16.7 percent of all farm operators were 65 years old and over. This is the highest percent ever recorded by a Census of Agriculture. Two-thirds of the farm operators 65 years old and over operated farms with sales of farm products of $50 to $2,499 in 1959.

The 1959 Census of Agriculture shows 3.7 million farming units in the 48 states. There are wide ranges in the size and productivity of these farming units, and these differences have become greater during the last five years.

On one end of the scale of size of farming operations are 1,200 farm units, each with sales of a half-million dollars or more of farm products annually. On the other end of the scale are 1.64 million farm units, each with annual sales of farm products of less than $2,500. Of this 1.64 million, 882,000 are farms operated by part-time farmers who either are working at jobs off their farms most of their time, or who are dependent upon other sources of income for most of their livelihood.

The 1.64 million farms with sales of less than $2,500 include also 404,000 operated by persons 65 years old or over, and who may be, in part, semi-retired. This 1.64 million total includes also 348,000 farmers who are not part-time farmers and who are under 65 years of age, on farms where the sale of farm products amounted to less than $2,500 in 1959.

The comparison of farms by value of farm products sold for the last two censuses is affected by the change in the definition of a farm. (See Table 3)

Farms Are Specialized

Much greater specilization and commercilization in the production of many farm products occurred during the last five years than during any 10-year period recorded by the farm census.

Notwithstanding increases in the value of products sold or quantity produced, farms having milk cows declined 39 percent, farms having chickens decreased 36 percent, farms raising turkeys declined 49 percent, farms selling eggs dropped 37 percent, farms raising vegetables for sale decreased 35 percent, farms harvesting Irish potatoes decreased 52 percent, and farms harvesting cotton declined 41 percent from 1954 to 1959.

Half as many farms had milk cows and chickens in 1959 as in 1950. The number of farms selling milk and eggs, and the number of farms raising turkeys, Irish potatoes, and cotton decreased at least 30 percent during the last five years.

These changes reflect rapid technological advances in production

Are these methods

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practices, sweeping change in the organization and operation of individual farms, the rapid increase on many individual farms in the use of nonfarm inputs, and the discontinuance of production by small producers with small-scale operations.

Moreover, many farmers have found during the last few years that the needs for increased skills, technical know-how, and managerial ability are so great that they have had, by necessity, to specialize.

The specialization of farm production on the larger producing units during the last five years has progressed at a faster rate than during any five-year period in history, and is much greater than shown by census totals for all farms.

Farms having 3,200 or more chickens have increased 125 percent, and farms having 50 or more milk cows increased 41 percent during the five-year period 1954-1959. About four-fifths of all turkey production was concentrated on 3,000 farms and about 80 percent of Irish potato production occurred on 15,000 farms in 1959.

More Non-Farm Inputs

The continued growth in the use of non-farm inputs are indicated by the results of the 1959 Census of Agriculture. From 1954 to 1959, the expenditure per farm increased 21 percent for feed, 12 percent for hired labor, 24 percent for machine hire, and 13 percent for gasoline and other petroleum products for the farm business.

Work off their farms was performed by 45 out of every 100 farm operators in 1959; 3 out of 10 worked off their farm 100 days or more in 1959. The increase in the production of farm operators working off their farms 100 days or more was greater during the period 1954-1959 than during any other five-year period except 1934-1939. (See Table 4)

In 1959, 1,340,000 farm operators or 36 out of every 100 farm operators, reported that the income they and members of their families received from other sources exceeded the value of all farm products sold. In 1954, 30 out of every 100 farm operators reported that the income of themselves and members of their families from other sources exceeded the value of farm products sold.

End

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the farm flock
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The National Junior Sheep Shearing Contest will be held at the Indiana State Fair, Indianapolis, Indiana, September 2, 1961. Prizes include a $300 college scholarship for the winner, a $200 and two $100 scholarships for second, third and fourth place. Scholarships are contributed by Sunbeam Corporation, co-sponsor of the contest.

Entry must be made by your State Extension Animal Husbandman in charge of sheep. (See your local county agent for his name and address.)

Let's keep up the interest in sheep husbandry. On most farms, for the investment and work required, sheep return the best profit. With the increased demand for wool products far exceeding the domestic supply, it is important that flocks be increased and shearing encouraged among farm youths. With larger flocks, and greater numbers of them, our supply of wool will more nearly meet national needs.

For information on visual aids, wall charts, special bulletins on shearing, write our Livestock Specialist.

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Why Farmers Produce Too Much

Continued from page 10-A

material and adds three bushels to yield or output. If no other costs are involved, it will be profitable if the cost of the material is no more than three times the price per unit of output. This is because one dose of the material would be highly profitable if the dose costs only two times the price per bushel of product. If the dose costs, say, $2 and the price of each unit of added yield is $1, the total return is three times $1, or $3—a return of $1.50 for each $1 invested.

It's this relationship of the resource or input cost to the price of the output (along with the increased productivity of the practice) that's important in the profitability and adoption of a new technique or practice. Simple arithmetic? Yes. Almost anyone could figure it out in one way or another. Millions of farm operators have. And this basic kind of reasoning goes a long way in explaining why our total farm output has increased so greatly and so rapidly.

We've Added Resources

The great increase in our farm output has taken place largely because agriculture has *purchased* and *added* great amounts of inputs or resources from off the farm. These have been added and used along with the land and labor resources already in farming. They've far more than offset the labor migration from farming and have added a tremendous amount of resources and potential productivity to agriculture.

The large and rapid increase in farm output wouldn't have been possible without these purchased and "imported" physical and material resources, some of which have productive power in themselves.

But it is by no means just the *knowledge* of new practices that has led to the output increases over the past 20 years. More nearly, it is the putting to use of materials produced in industries outside of farming that accounts for this.

Take away fertilizer, insecticides, power machinery, feed ingredients, etc., and the knowledge of them would still exist. But farm output would drop about as rapidly as it has increased.

Where We Get Resources

The additional agricultural resources coming from what we might call "resource furnishing industries" have made possible the rapid and large increases in farm output. Even such things as hybrid corn seed and special ingredients for feeds are coming less and less from firms producing commodities for consumers in general and more and more from firms specializing in agriculture. And these products have had a sizeable role in contributing to our farm productivity.

These products aren't just produced for the fun of it any more than the practices and techniques that use them are adopted that way. The fact that they're profitable lies behind both their production and use. Their use is profitable because these products are priced favorably in relation to the farm commodities they produce or help in producing.

How It Works

Especially in the past 20 years, the prices of important purchased and "imported" resources have fallen in relation to the prices of the farm products they produce. Accordingly, it has become more and more profitable to use them in spite of the lower farm prices resulting from increased output.

Hybrid corn seed is one example. Its cost, in relation to market prices for corn, was less than proportional to the yield increase it gave. Over time, the price of hybrid corn seed has fallen even lower relative to the market prices of farm-produced corn. It was more profitable to use hybrid corn seed in the 1950's than it was in the 30's. From 1935-1939 the price of a bushel of hybrid corn seed averaged about 15 times the price of market corn; today, it's roughly only 11 times.

Fertilizer is an even more striking example. With inflation, the prices of both fertilizer and farm products have increased. But farm product prices increased more rapidly than fertilizer prices in the 20-year period, 1940-59. Even now, with farm prices receding, it takes fewer bushels of corn to buy 100 pounds of fertilizer than in 1939. In the most recent five-year period, it took only 70 percent as much in farm products to buy 100 pounds of fertilizer as it did in 1935-39. It's more profitable to use fertilizer now than in 1939 or than in the more prosperous war years.

It's true that many more farm operators now know about fertilizer and use it, but the profit incentive and reward also is greater. Farm operators do respond to these price relationships—whether for fertilizer or the many other chemicals and materials that represent additions to our agricultural resources.

Without these additions to resources being purchased and brought into agriculture, we couldn't produce a farm output at today's levels.

Farmers might produce more of their own improved seed, though not at as low a cost as they can now buy it. But farmers could hardly supply their own chemical fertilizers, insecticides and pesticides, tractors, other machinery, livestock equipment and feed additives.

Some of the increase in farm output has come purely within agriculture—improved rotations, more timely planting and harvesting dates, etc. But take away the resources now supplied and purchased from outside, and a major portion of our farm productivity increases over the past 20 years would be erased. These resources, however, are available—and most important—generally profitable.

Why Are They Profitable

These resources that are bought and brought into agriculture have been favorably priced, and the practices

(*Continued on page* 30)

EDUCATIONAL INSERT

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How Midwestern Farmers Control Weeds In Corn

by Dr. William F. Meggitt

Weeds are among the greatest contributors to the annual cost of production in corn. They reduce yields by competing for nutrients, sunlight, and moisture throughout the entire growing season. They are extremely competitive in the early stages when the corn is small and struggling to get established. Annual broadleaved weeds and grasses that are left to compete with the corn for 2 or 3 weeks after emergence have reduced yields as much as 20 bushels per acre.

The cost of additional labor and equipment for weed removal increases production costs. Weeds, especially those missed in early stages by cultivation, are a deterrant factor in the harvesting operation.

Herbicides Available

There are presently available several herbicides which the farmer may use to help combat his weed problems in corn and perhaps lower the cost of production or minimize losses. These chemicals may be used to supplement and in some cases replace cultural practices presently used for weed control.

Triazines. Simazine and more recently Atrazine have been evaluated and are being used widely to control weeds in corn. For maximum effectiveness either of these materials should be applied during or immediately after corn planting so that they can be moved into the soil and are available to kill the weeds as they germinate. As with all pre-emergence herbicides, that is, those that are applied prior to emergence of the crop, rainfall is necessary to move these materials into the soil where they will be in contact with the geminating weed roots. Atrazine also has the capability of killing weeds after they have emerged but when they are still in the two-or three-leaf stage and are very young. This, then, lends versatility to the use of Atrazine in cases where the applica-

SUMMARY AND CONCLUSIONS

- **On most soil types 1 or 2 cultivations can be eliminated when an overall application of herbicides is used to control weeds.**
- **Chemicals will not replace other good farming practices and an effort should be made to bring weed control to bear throughout the entire crop rotation by cultural and chemical means.**
- **In the case of pre-emergence chemicals, such as Simazine and Atrazine, it should be noted that for maximum effectiveness they should be applied at or immediately after corn planting so they will kill weeds as they germinate.**
- **In the case of band application it is important to control weeds between the rows with regular cultivation. Weeds between the rows can cut yields as much as 10 bushels per acre.**
- **On soils in good tilth, and where broadcast herbicide treatment is applied, usually there is no benefit from cultivation when weeds are controlled throughout the season with chemicals.**

Atrazine 80 W at 2 lbs./A active ingredient applied in 30 gallons of water the day after planting on Conover Silt Loam Soil. There was no cultivation during the entire season

tion is delayed because of farm work for inclement weather and weeds have germinated and emerged from the soil. Simazine will not kill weeds by foilage contact action after they have emerged, as is the case with Atrazine. However, it is still the best practice to apply the Atrazine soon after planting so that it is in the soil and available for killing weeds at the time that they germinate rather than allowing them to emerge, because in many cases, if the weeds are allowed to emerge they may get too large before the Atrazine is applied and weed control will not be satisfactory. Atrazine being somewhat more soluble than Simazine will work under conditions of less rainfall.

Both of these materials are available as 80 percent wettable powder formulations which are applied as sprays in 20 to 40 gallons of water per acre, and they are also available on granular carriers for dry application. Each of these materials, when applied at the rate of two to three pounds of active ingredient per acre, will provide control of both annual grasses and broadleaf weeds throughout the entire growing season in corn. In certain areas of the Corn Belt where soil organic matter is high, the rate should be increased for maximum effectiveness. On organic or muck soils rates of 4 pounds of active ingredient per acre may be necessary.

It should be noted that because of the residual nature of these materials in providing weed control throughout the entire growing season, it is rather difficult to establish a cover crop in late summer on soil treated with Simazine or Atrazine. Application of these materials in a 12 to 14-inch band over the row and removal of the weeds between rows by cultivation will provide an opportunity to establish a cover crop in the area between the rows which has not been treated with Atrazine or Simazine.

Research in the past two or three years has shown Atrazine to be effective for the control of quackgrass. Atrazine should be applied in the fall or spring at the rate of four pounds of active ingredient per acre. Spring treatment should be applied 2 to 3 weeks prior to plowing. In combination with other herbicides such as Amitrole-T or dalapon, lower rates have aided in quackgrass control.

2,4-D. The most widely used and cheapest herbicide in corn is 2,4-D. It may be used in two ways to control annual weeds in corn. First, it may be applied as a pre-emergence treatment after the corn has been planted but before the weeds and corn emerge. This type of application generally provides control of both annual broadleaved weeds and annual grasses for a period of four to six weeks after application. The 2, 4-D is broken down in the soil and after this period subsequent cultivation is necessary. However, it does provide control over the early critical period and will generally replace one cultivation. In areas where a severe annual grass problem exists, 2, 4-D may not be effective in control of such grasses. The rate of 2,4-D that can be safely used pre-emergence on corn is not enough for maximum kill of grasses under certain conditions. Continued use of 2, 4-D as a pre-emergence treatment and a minimum of cultivation often results in the development of an annual grass problem.

The 2, 4-D may also be applied as a spray for the control of annual broadleaved weeds after the corn has emerged. Again, it is necessary to make the application early in order to remove the weeds when they are still quite small and have not afforded competition to the corn. In this situation the corn can be treated over the top until the time that it reaches 6-8 inches, and with drop nozzles may be treated to a height of eighteen inches. For this post-emergence application, an amine salt of 2, 4-D should be used, whereas, with the previously mentioned pre-emergence application an ester formulation of 2, 4-D should be used. In the pre-emergence application the ester is used because it is not soluble in water and is less likely to be moved into the area of the germinating corn seed and thereby, cause injury. The amine salt being water soluble will move more readily in the soil and could move into the crop seed zone and injury may occur.

Other Herbicides

Randox and Randox-T are other compounds which are finding considerable use for weed control in corn. Randox has been available for several years and is effective in controlling weeds in corn where the major weed problem is annual grasses. More recently another material was added to Randox to increase the effectiveness in the control of broadleaved weeds. Randox-T, as the combination is called, is as effective as Randox in the control of grassy weeds and more effective in the control of annual broad-leaved weeds. These materials should also be applied as pre-emergence treatments soon after the corn is planted and before any weeds emerge. Depending on the amount of rainfall, soil type, and other environmental factors, control of annual weeds can be expected for approximately four or five weeks. As with 2,4-D, control is provided during the early critical period, and generally, the first cultivation which is slow and tedious is eliminated.

DNBP. Dimitro is another chemical which has found use in certain areas for controlling weeds in corn. It is less hazardous than 2,4-D in those areas of light sandy soils and on certain hybrids which may have less toler-

ance to 2,4-D. Dimitro is in the group of materials which provide control for a period of approximately 4 weeks after emergence of corn. It can be applied anytime from planting until emergence of corn. The chemical is effective for weed control when applied at the time corn and weeds are emerging. Much of the variable results obtained from a strictly pre-emergence application, due to climatic conditions, are eliminated because the weeds are killed on contact. Some "burning" of corn shoots results from this treatment but yields are not effected when treatment is made at emergence.

Band Application

In the past several years and especially since the introduction of more specific herbicides for specific crops or weed problems which have entailed higher costs for the chemical, there has been more use of band applications. By applying a band of 12-14 inches the area covered is approximately one-third of the total area and this reduces the chemical cost by two-thirds. However some cultivation is necessary because any weeds between the rows are providing competition to the corn in the first 3 or 4 weeks. Yield reductions of 8 to 10 bushels have been reported where the weeds outside the treated band were allowed to remain for 4 weeks. It is a fallacy to believe that as long as a weed-free band exists over the row that those weeds between the rows can be removed whenever it is convenient. However, the cultivation necessary in conjunction with a band application is faster and less injurious than where no chemical is used.

Cultivation

On most soil types 1 or 2 cultivations can be eliminated when an overall application of herbicide is used to control weeds. Generally on heavy soils (clay loams) or where corn follows corn in the rotation there is an increase in yield from 1 cultivation when it is compared to no cultivation. On light soils and soils in good tilth usually there is no benefit from cultivation with respect to yield increases when weeds are controlled throughout the season by chemicals. In many instances there are injurious effects from cultivation especially from root pruning which is a result of having shovels set too close in order to remove or cover those weeds in or near the row. Further, each cultivation involves additional compaction of soil even though the surface layer may be loosened. Estimates on cost have varied from $1.50 to $2.20 per acre for each cultivation and certainly the first one which is slow and tedious is the most costly. While herbicides may not replace all cultivation, the number can be reduced and this saving can be applied to the cost of the herbicide.

Granular Formulations

The use of granular formulations of herbicides created much interest during the past season. Research has shown that those chemicals which are available for controlling weeds in corn are equal in effectiveness when applied as a spray or granular formulation when uniform distribution is insured. A number of problems arose when farmers attempted to use granular carriers in the equipment presently available. Among the problems were improper calibration, improper metering, bridging of chemicals, wide variations in granule size, and concentrations too high to allow sufficient carrier for uniform and adequate distribution. In those cases where the rate of toxicant was either too high or too low as a result of poor distribution over the soil surface, the results were ineffective weed control or in some cases crop injury. Granular applications have several advantages in that they are convenient to use, there is less danger to nearby susceptible crops, and with many herbicides there is considerably more selectivity than with the spray formulation. Equipment will become more refined and formulations improved so that in the coming season more adequate and uniform distribution of granulars will be obtained.

Label is Important

In the use of all herbicides it is necessary to follow the specific instructions on the label. This is the growers' guide that the chemical is properly registered according to U. S. Department of Agriculture regulations. Following the label provides safety to the crop and to the user and allows for maximum effectiveness. In addition, state and local extension recommendations should be followed for more explicit directions for a certain area or for adapting these herbicides to local conditions.

Weeds a Total Farm Liability

In developing a weed control program for corn, it should be borne in mind that chemicals will not replace good farming practices. Full use should be made of good seed, minimum tillage and proper seed bed preparation. Correct cultural practices allow the corn to

Michigan hybrid field corn in which no weed control has been practiced. Major weed species are barnyard grass, foxtail, lambsquarter and pigweed.

make maximum growth in the early stages. We must consider weeds as a total farm liability and thereby charge the cost of control to the over-all farm operating charges. In considering a herbicide such as Atrazine or Simazine for weed control in corn for the entire season, the cost would seem high if the entire charge for the herbicide is applied against the corn crop. However, in charging it to the over-all farm operating cost, we should keep in mind that by having weeds controlled in corn we are perhaps able to make hay which is worth several dollars more per ton. By using a herbicide which will provide full season weed control the number of cultivations can be limited to one and in many cases none, and this then frees the grower for other important and timely jobs.

Another consideration in the weed problem is that we should attempt to bring weed control pressure to bear throughout the entire rotation by cultural and chemical means. By rotating crops and herbicides which have different types of specificity, undesirable shifts in weed populations will be prevented. Perhaps by using materials that will control weeds throughout the entire growing season in corn for one or two seasons will reduce and eliminate the need for more than minimum weed control practices in subsequent crops. Again, here is a situation where the entire cost of weed control should not be charged to the corn crop in that weeds in the area will be reduced and the need for costly weed control practices in subsequent crops will be minimized.

In some areas Atrazine and Atrazine with combinations of amitrole-T or dalapon have proven promising

Plot on left treated with 2 pounds of Simazine per acre, on right, no weed control.

for control of quackgrass. The elimination of quackgrass by these chemicals or combinations require generally a higher rate of herbicide and thereby entail greater costs. However, if weeds such as quackgrass can be considered a general farm liability, and the cost of their control absorbed as an over-all farm operating charge, then the greater cost to eliminate such a weed pest is justified.

In developing a weed control program for corn, herbicides should be considered as tools to supplement good cultural practices and can be used in many cases to reduce over-all production costs.

The author, Dr. William F. Meggitt is associated with the Michigan State University, Department of Farm Crops.

BETTER FARMING METHODS
Mount Morris, Illinois

Please send me ..... copies of Atrazine and Simazine corn brochure (GAC 730).

Please forward ..... copies of "How Midwestern Farmers Control Weeds In Corn" (GAC 737)

Kindly schedule the motion picture, "A Way With Weeds" for

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Send to:

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CITY .....STATE .....

ANOTHER OF A SERIES ON LEGUME INOCULATION

"why didn't somebody think of this before?"

Time after time, last season, we heard this typical reaction to Nitragin custom soybean inoculation from *both* farmers and seedsmen.

Farmers willingly paid the small extra charge to have their seed beans custom inoculated. Now, they could get the extra two or more bushels per acre from effective soybean inoculation *without* the extra work and bother of on-the-farm, planting-day application.

MORE CUSTOM INOCULATION IN 1961

Even more farmers will want custom inoculation in 1961 — more dealers will offer the service. This is fine, *IF* custom operators will take the necessary steps to insure a genuinely thorough job. The bacteria must stay alive on the seed and bring about effective nodulation. Unfortunately, this requires *more* than just putting ordinary inoculant on seed in advance of planting day — *otherwise we would have had custom inoculation years ago!*

NITRA-COAT MAKES IT POSSIBLE

The "break-through" that made custom inoculation a practical reality came when the Nitragin Company developed Nitra-Coat. This protective sticking agent for use with legume inoculants helps hold the inoculant to the seed, protects the bacteria and keeps them alive and vigorous. Soybean seed may be effectively inoculated months ahead of planting when seed are kept cool.

ALWAYS MAKE THESE RECOMMENDATIONS

Custom inoculation is inexpensive, saves valuable time on planting day and gives the farmer results he can measure — more bushels per acre.

To insure best results from custom inoculation, these recommendations should be followed:

1. Select an inoculant of known high quality — one with GUARANTEED high bacteria content.
2. Use Nitra-Coat sticking and protective agent to help hold the bacteria to the seed, nourish them and protect them to keep them alive and vigorous.
3. Apply inoculant slurry thoroughly, so that each seed is covered.
4. Store inoculant and inoculated seed in a cool place to protect the bacteria.

NOW... for the farmer who wants to do his own inoculating...

NEW DOUBLE-SIZE NITRAGIN SOYBEAN PACKAGE CONTAINS TWICE AS MUCH INOCULANT

★ **APPLY WITHOUT WATER**... new double-size package provides the extra inoculant you need — use as it comes from the package, or...

★ **APPLY WITH WATER**... and the new double-size package inoculates twice as much seed. Apply as a slurry with water and get the biggest inoculant value on the market.

★ **FOR PREINOCULATION**... apply as a slurry with NITRA-COAT months before planting with assurance of full effectiveness when inoculated seed are properly stored.

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INSECTICIDE

Controls major insect pests of many fruit, vegetable and field crops at a new low cost!

There is a big and growing demand for SEVIN—the insecticide that last year gave so many fruit, vegetable and cotton growers outstanding control of major insect pests. Volume demand means volume production—and new low prices in 1961 that provide true economy and efficiency in insect control.

SEVIN is available in spray and dust formulations to fit local needs. Many new uses are being tested and labelled in addition to the accepted uses listed below.

CROPS	INSECTS CONTROLLED	DOSAGE*	LAST APPLICATION
Apple and Pear (West of the Rockies)	Codling moth, green apple aphid, pear psylla, orange tortrix, eye-spotted bud moth, California pear-slug, tentiform leaf miners, San Jose, oystershell and Lecanium scales	¾ to 1 lb. active SEVIN per 100 gallons dilute spray Applications in 1st cover have caused thinning; to avoid this delay use until 2nd cover	1 day before harvest Tolerance 10 ppm
Apple and Pear (East of the Rockies)	Codling moth, green apple aphid, white apple leafhopper, apple mealybug	½ lb. active SEVIN in 100 gallons dilute spray	1 day before harvest Tolerance 10 ppm
	Apple maggot, plum curculio, rosy apple aphid, red-banded and fruit tree leaf rollers, Eastern tent caterpillar, pear psylla, periodical cicada, eye-spotted bud moth, European apple sawfly, Japanese beetle, tentiform leaf miners, Forbes, San Jose, oystershell and Lecanium scales	1 lb. active SEVIN in 100 gallons dilute spray Applications in 1st cover may cause thinning; to avoid this delay use until 2nd cover or at least 15 days after petal fall.	
Peach	Oriental fruit moth, peach twig borer, lesser peach tree borer, plum curculio, cat-facing bugs, periodical cicada, Western spotted cucumber beetle, Japanese beetle, Lecanium, San Jose and olive scales	1 lb. active SEVIN per 100 gallons dilute spray (For best scale control, apply when crawlers are present)	1 day before harvest Tolerance 10 ppm
Cherry, Plum Prune	Cherry fruit fly, fruit tree leaf roller, peach twig borer, lesser peach tree borer, black cherry aphid, eye-spotted bud moth, plum curculio, red-banded leaf roller, Japanese beetle, Forbes, San Jose, oystershell and Lecanium scales	1 lb. active SEVIN per 100 gallons dilute spray	1 day before harvest Tolerance 10 ppm
	Codling moth, Eastern tent caterpillar, orange tortrix, Western tussock moth	¾ lb. active SEVIN per 100 gallons dilute spray	
Filbert	Filbert worm, filbert aphid, filbert leaf roller	40-50 lbs. 10% dust per acre	60 days before harvest no residue
Grape	Grape leaf folder, grape leafhopper	½ to 1 lb. active SEVIN per 100 gallons	Day of harvest Tolerance 10 ppm
	Grape berry moth, Japanese beetle	1 lb. active SEVIN per 100 gallons	
Strawberry	Meadow spittlebug, leaf roller	1 lb. active SEVIN per 100 gallons	1 day before harvest Tolerance 10 ppm
Non-bearing Citrus	Western tussock moth, orange tortrix, fruit tree leaf roller, citrus cutworm	1 lb. active SEVIN per 100 gallons	Apply only when no fruit is present

CROPS	INSECTS CONTROLLED	DOSAGE*	LAST APPLICATION
Beans	Mexican bean beetle	½ lb. active SEVIN per acre	Day of harvest Tolerance 10 ppm
	Leafhoppers, bean leaf beetle, cucumber beetles, Western bean cutworm, flea beetles, Japanese beetle	1 lb. active SEVIN per acre	
	Corn earworm, armyworms, velvet bean caterpillar	1 to 1½ lbs. active SEVIN per acre	
	Lima bean pod borer, Lygus and stink bugs	2 lbs. active SEVIN per acre	
Corn	Corn earworm, European corn borer, fall armyworm, sap beetles, Japanese beetle	1 to 2 lbs. active SEVIN per acre	Day of harvest Tolerance 5 ppm (Except—7 days before harvest when forage is fed to livestock Tolerance 25 ppm)
Tomato Eggplant Pepper	Tomato fruitworm, fall armyworm, flea beetles, leafhoppers	1 lb. active SEVIN per acre	Day of harvest Tolerance 10 ppm
	Tomato hornworm, European corn borer, stink bugs	1 to 2 lbs. active SEVIN per acre	
Cucumbers Summer Squash	Pickleworm, melonworm	½ lb. active SEVIN per acre	Day of harvest Tolerance 10 ppm
	Cucumber beetles, squash bugs, flea beetles	1 lb. active SEVIN per acre	
Potato	Colorado potato beetle	½ lb. active SEVIN per acre	No time limit (No residue tolerance required)
	Leafhoppers, flea beetles	1 lb. active SEVIN per acre	
	Lygus bugs	2 lbs. active SEVIN per acre	
Ornamentals (see label for the many plants covered)	Bagworm, Japanese beetle, flea beetles, lace bugs, leafhoppers, scale insects, rose aphid and slug, tent caterpillar and many others (See label for full list)	2 lbs. SEVIN 50W per 100 gallons (2 tablespoons per gallon water)	No time limit (No residue tolerance required)
Turf	Chinch bugs, fall armyworm, leafhoppers, sod webworms or lawn moths	1 full measuring cup SEVIN 50W in 15 to 20 gallons water per 500 sq. ft. of lawn	(No residue tolerance required)
Animals: Dogs and cats	Brown dog tick, fleas	5% SEVIN dust—rub in skin and apply in sleeping quarters weekly	Don't treat kittens under 4 weeks old
Cotton	Thrips, flea beetles, fleahopper, leafworm, striped blister beetle	½ to 1 lb. active SEVIN per acre	No time limit Tolerance 5 ppm on cottonseed
	Boll weevil, bollworm, fall armyworm, leaf perforator, leaf rollers, leafhoppers, tarnished plant bug, light to moderate numbers of Western lygus bug (aphids will be repressed by repeat applications in a schedule)	1 to 2 lbs. active SEVIN per acre	
	Pink bollworm	1½ to 2½ lbs. active SEVIN per acre	
	Salt marsh caterpillar, stink bugs	2 lbs. active SEVIN per acre	
	Grasshoppers	½ to 1½ lbs. active SEVIN per acre	

*One pound of active SEVIN equals 2 pounds of SEVIN 50W, or 10 pounds of SEVIN 10% dust formulation. Read the label and follow directions carefully for best results. Check your state authorities for additional local recommendations.

Safer to use than many other insecticides, SEVIN is long-lasting even in hot weather and is effective against a wide range of insects, including many insects that are resistant to other insecticides. SEVIN can be used close to harvest without danger of excessive residues, when label directions are followed.

For full information on new or specific crop uses of SEVIN, write to Carbide at the address below.

SEVIN and UNION CARBIDE are registered trade marks of Union Carbide Corporation.

UNION CARBIDE CHEMICALS COMPANY

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"SCATTERED AGENTS" SOLVE PROBLEM

Continued from page 13

meeting whom we ordinarily do not have an opportunity to work with — the big, high-income farmers."

Farmers in nine different counties meet each month to discuss farm management problems in district I where James Murphrey is area specialist. "The same people come month after month," Murphrey reveals. "We have also recently held 15 income tax meetings with a total attendance of 461 persons. In these meetings, the people have requested meetings on other subjects such as estate planning, Social Security, keeping records, analyzing the farm business, depreciation and depletion, capital gains and losses and soil conservation expenditures."

Those Tough Questions

Too, farmers are asking county agents these kinds of questions: How do profits in one enterprise compare with profits in another? How much return can be expected from certain farm products? How much will fertilizing certain crops return and what are the optimum rates of applications? Is this a good time to buy, sell, or feed a particular class of livestock?

"Most of our area is changing from a grain-deficit to a grain-surplus area," says Sidney L. Jenkins, area farm management specialist in a Central Texas district. "Our farmers are concerned about the possibility of selling the surplus grain to feeders in other sections or feeding it to livestock on their own farms. To help answer the question, we prepare cost and return budgets to discuss in group meetings which show the resources needed and estimated returns from a feeding operation."

More Local Cooperation

"When an area management specialist is available, we obtain better cooperation from local sponsors working with Extension groups," says Joel Reese, county agent at Bastrop, Texas. "For example, G. B. Mack, vice president of the First National Bank at Bastrop, told me that if someone would be available to give training in the use of record books, he would sponsor 200 record books for farmers and ranchers. When I told him about our area farm management specialist, he responded. And so did two other bankers who sponsored an additional 400 record books."

Perhaps the most striking influence of area farm management that could affect the entire agriculture of the nation is found in a statement by James Murphrey, area farm management specialist at Amarillo. He is pushing farm records, analysis and planning, adoption of high level resource allocation and sound marketing practices. "Farmers are gaining a new concept of meeting their problems," he observes. "**They are changing their attitude that to meet new and unfavorable situations they must increase production. Instead, they are finding their answers in increased profits per unit of their normal production.**" End.

ECHOES . . . . . *letters from our readers*

CONCERNED WITH PUBLIC RELATIONS

The choice of articles and the editorial in the January issue of Better Farming Methods was so well done that I would like to commend you and your staff.

We in agriculture are very much concerned with the poor public relations that we have with our consumers. Some of the reasons for this situation were very clearly presented by Robert Haigler in his splendid article entitled, "A Farmer Answers His Critics" . . .

You certainly are doing your part. Again my compliments. — *J. Richard Beattie, Extension Cranberry Specialist, Cranberry Experiment Station, East Wareham, Massachusetts.*

FARMING THE FARMER?

First, I would like to compliment you and your staff on the constructive articles and editorials in your splendid publication. I was particularly impressed by your editorial, and the feature articles in the current issue of Better Farming Methods — especially the one by Mr. Haigler, "A Farmer Answers His Critics". After 40 years as an Extension worker and farmer, I am more concerned about the plight most of our farm people are in today than ever before, and I am getting rather fed up on all the "bally-hoo" being dished out by some of our national farm organizations, agricultural officials and "economists" in the USDA and elsewhere. Most of them are just "farming the farmers" rather than actually helping them . . . — *D. T. Painter, Independence, Virginia.*

FINEST I'VE EVER READ

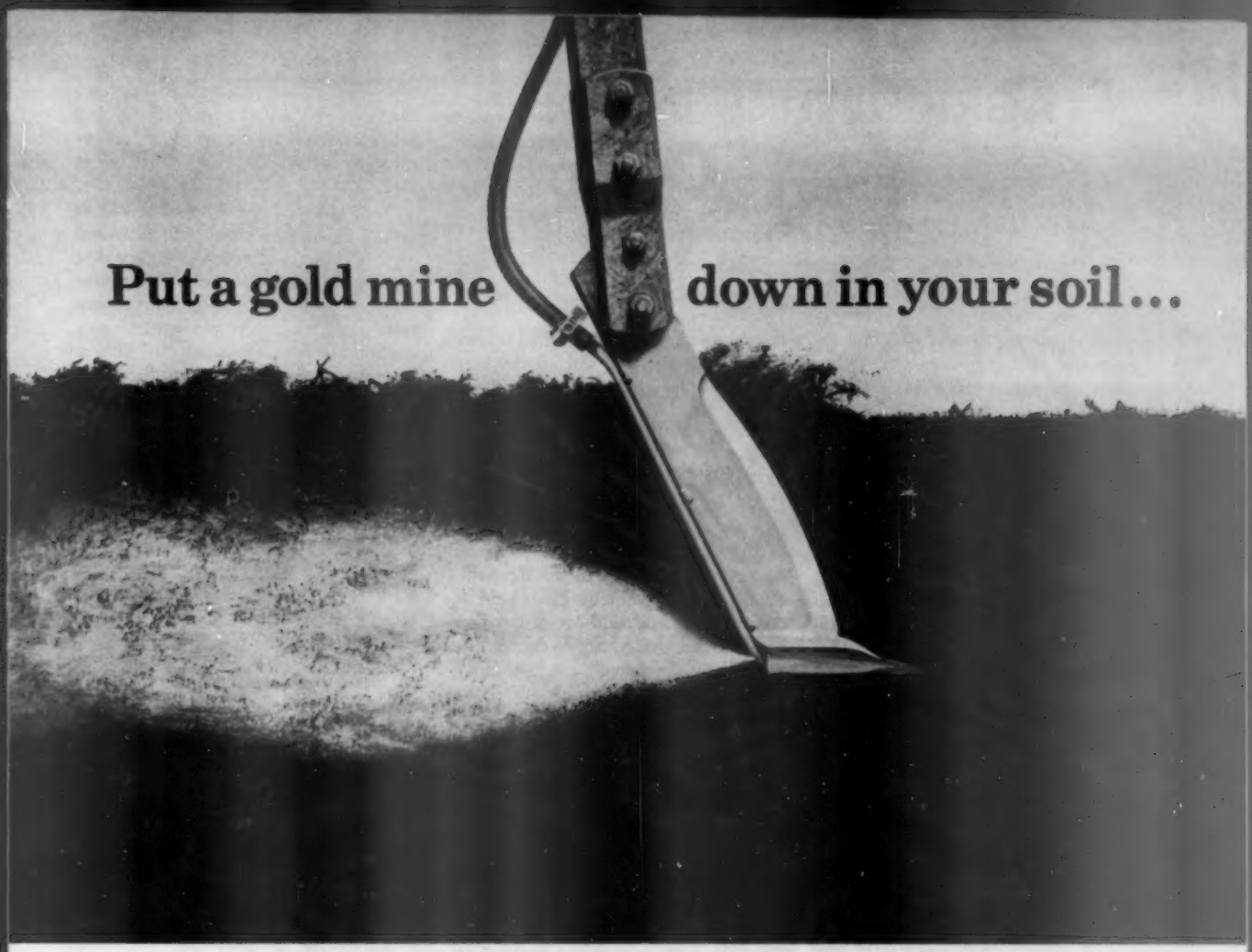
I consider the article "A Farmer Answers His Critics" by Robert Haigler one of the finest articles on consumer-producer relations I have ever read. I would like to see it published in Readers Digest and all consumer magazines . . . — *Cecil G. Stockwell, Broadmeadow Farm, Great Barrington, Massachusetts.*

Farmer Haigler scored a bit with his article, "A Farmer Answers His Critics". We're sorry we don't have space to print more of the nice letters he received. Thanks to all of you. — Editors

A SUPER FARM ORGANIZATION?

I have enjoyed receiving your magazine very much and look forward to it each month. In your January issue your article on "Who Speaks For the Farmers" is worthy of comment.

The representatives of the three major farm organizations speak of working together on many farm programs which they can agree on, but I think it is high time for them to sit down around the conference table and discuss the vital issues which they disagree on. Maybe it is time for some kind of a super farm organization which will include all of the major farm organizations, to arbitrate their differences and start to pull together in one direction . . . — *William G. Zuber, 439 Paul Road, Rochester 11, New York.*



Let your Phillips *66* Ammonia Distributor put back harvested nitrogen where it came from

Last year's crops drained tremendous amounts of nitrogen from your soil. This nitrogen must be put back down in the root zone just to maintain your crop profits.

That's why more and more farmers now apply Phillips *66* Ammonia down in the soil. It helps balance plant food withdrawals and adds the extra nitrogen to cut cost per bushel and increase net profit per acre.

Find out how this 82% nitrogen fertilizer (1) applies uniformly and is sealed in the soil; (2) feeds plants as needed during early growth; (3) continues to feed plants throughout the growing season.

Remember to see your Phillips *66* Ammonia Distributor for dependable service from local tank storage. Phillips Petroleum Company, Bartlesville, Oklahoma.

Put back the nitrogen needed to grow top yields with this 82% nitrogen fertilizer

CROP	YIELD	NITROGEN REMOVED
corn (grain)	100 bu.	90 pounds
grain sorghum (grain)	60 bu.	50 pounds
cotton (lint & seed)	1½ bales	57 pounds
wheat (grain)	40 bu.	47 pounds
oats (grain)	75 bu.	53 pounds

(Figures vary with soil type, season and fertility of soil)

Look for this sign of better Ammonia Service

PHILLIPS 66

AGRICULTURAL AMMONIA

AGRICULTURE IN AN UNEASY WORLD

continued from page 11

And I believe, finally, that the supreme test of any government policy in agriculture or outside of it should be:

"How will this affect the character, morale, and well-being of our people."

A planned and subsidized economy weakens initiative, discourages industry, destroys character and demoralizes the people — and surely is not good for America . . .

Based on a lifetime of experience as a farmer and in farm related activities, including eight years as Secretary, this is what I think needs to be done in the best interests of our farm people, the nation, and the free world.

First, the "Food for Peace" program should be continued and expanded where feasible. Remarkable use has been made of our surplus stocks through special export programs, but there are additional steps that can be taken. Food is serving humanitarian needs in foreign lands. aiding in economic development, and promoting the cause of peace and freedom.

Second, programs of research to develop new foreign and domestic markets, including new industrial uses, for our farm products should be vigorously pushed forward.

Third, laws should be enacted to improve the price support mechanism by providing levels of price support that will allow farm commodities to move into regular marketing channels, and at the same time afford adequate price protection.

Fourth, the use of farmland should be further adjusted in accordance with needs by such a program as an expanded Conservation Reserve.

Fifth, the Rural Development Program should be emphasized and expanded as rapidly as is feasible. We can help our small farmers make the adjustments which they want and need to make to improve their standard of living.

I would emphasize that as Secretary of Agriculture there are many more joys than disappointments — many more achievements than frustrations. In spite of the inevitable controversy it is a wonderful opportunity to serve people who are the salt of the earth — American farmers and ranchers.

ANDERSON: "The first thing a Cabinet member must understand — and never forget — is that he is a part of "the administration." This means he is an integral part of the Executive Branch of Government. He is held accountable *indirectly* through the President of the United States rather than *directly* by the voters.

All citizens should understand that the Secretary of Agriculture is primarily an "administrative officer" in the Executive Branch of Government. I'm afraid there is widespread confusion on this point.

I sincerely hope the appearance on this program of five former administrative heads of this particular government agency — the U. S. Department of Agriculture — doesn't divert attention from where the primary responsibility for government farm policy determination *really* rests — namely, with the Congress and the farmers' own organizations . . .

Looking ahead for the next decade, what should we do, taking into account the national and international problems and pressures that are likely to influence policy actions?

It is most unfortunate that in agricultural program discussions during the recent post-war years, the country has had its attention focused primarly on the question of price supports — whether they should be rigid or flexible. The great argument largely ignored the fact that price supports by themselves do not provide the complete and effective kind of program needed by our agriculture and the national economy . . .

In dealing with the problems of agriculture and its people, we must first decide, as a *Nation,* what kind of agriculture we really want. We can decide between a democratic world of abundance and a regimented world of scarcity. When that decision is reached, we then must be willing and ready to do what it takes to bring about such an agriculture and be prepared to stand the cost of getting it done.

As I envision the kind of world in which we live, we have no practical alternative but to accept the fact that our agriculture must be one of abundance. We therefore must learn to live with it — to organize our agriculture's capability for abundance, to sustain it, and to make it conform to the realities of demand, national and world conditions, and the progress of science and technology.

There is no mistaking of the fact that adjustment is needed in agriculture from the pattern that has evolved during the recent war and post-war years. In bringing about this adjustment, we face the dilemma of doing this without hurting the farmer — of trying to maintain and improve living conditions for farm people in the face of increasing improvement in technology in farm production.

What is required is not so much a detailed legislative formula, but the development of the kind of flexibility that will permit the managers or administrators of the program to make needed decisions under the broad guidelines of congressional intent. We also need competent administration and a will to administer proper programs despite the pressures.

Overall, we need a more realistic and forward-looking approach to our agricultural and rural problems. Fundamentally, the broad requirements for such an approach have not changed much over the past decade and a half. My own feeling is that a policy of organized, sustained and realistic abundance still makes sense for this country's agriculture and its people; and it also makes sense if we are to accept and carry out our responsibilities of leadership in the world of nations.

BRANNAN: . . . The Secretaries of Agriculture present here today have all been confronted with the problems which have arisen out of our capability to produce food abundantly and our apparent lack of ability to move this abundance into the hands of consumers at home and abroad.

May I say here, parenthetically, that this is one of the few nations on the

(*Continued on page* 33)

If you are an agricultural leader...

We have much in common

You, the agricultural leaders and influential farmers, play a vital role in the ever-changing, ever-challenging farm picture. Your influence spreads over wide areas, and the success of many a farm operator depends on how fast he adopts new farm tools and practices that you have shown to be of great value. Thus, you have a big responsibility, because others look to you for new and better ways of doing things.

We, here at Dr. Salsbury's Laboratories, are in a similar position. Over the years, growers have come to rely on our many health products and field services. Our complete line of proven products (for both poultry and hogs) is serviced by a field staff of more than 70 capable, experienced men. These men have a grand total of over a thousand years working firsthand with growers all over the country.

This unique combination of products and service is one of the reasons why growers look to us for continuing leadership in the field of poultry and livestock health. Just as they have learned to depend on you, they have also learned to depend on Dr. Salsbury's Laboratories—and for the same reason: *they make more money that way.*

Another thing we have in common is the management approach to farm problems. For years, we have emphasized that flock health is necessary to profits. And we've also stressed—as you have—that medication should be used only to supplement good flock or herd management, *not as a substitute for it.*

We are glad to share with you the job of helping keep the American farmer the envy of the agricultural world. Let us know when you can use more information about any of Dr. Salsbury's many products and services. Please see the local Dr. Salsbury dealer or write direct.

Dr. SALSBURY'S LABORATORIES
Charles City Iowa, U.S.A.

MORE THAN PRODUCTS—A SYMBOL OF SERVICE

"...farmers continue to expand when it is profitable"

Continued from page 22

involving their use have been adopted because of two things:

•The prices of farm products have been high enough for a favorable cost-return ratio.

•The prices of these purchased resources have been kept comparatively low by technical improvements and competition among the firms that produce and supply them—also contributing to a favorable cost-return ratio.

Technical improvements in the resource furnishing industries are perhaps more the key—through achieving favorable prices—to widespread adoption and use than the technical improvements discovered in the agricultural research institutions. The latter, in effect, opened up knowledge of a practice and its productive response. The supplying industries helped the practice to become more and more profitable through new technology and distribution methods that kept the cost relatively low.

Added to this are the sales programs of firms selling these inputs to agriculture. They, likewise, are important in calling attention to the materials and the practices in which they're used. Is this an attempt to fix blame? No. To do this, we'd first have to decide that the development, improvement and promotion of something that is and remains profitable—both for the supplying firm and for the individual farm operator who uses it—is "bad" or a "sin". And actually only those things which have, in fact, been profitable have been widely adopted by farm operators.

Can we, then, blame this "individual farm operator"?

Not unless the adoption and use of a profitable material or practice is blameworthy in the absence of deception or fraud. Bear in mind, too, that economic progress —the availability of more goods and services per person —comes from the knowledge, development and application of new technologies in all industries and the availability of the manpower and other resources to produce them. And there's still more to the picture.

Not all costs in agriculture have fallen or kept low relative to farm product prices. Otherwise, farming wouldn't now be the victim of a cost-price squeeze. Fixed costs in particular have gone up. The cost of labor (a resource migrating from agriculture) has gone higher and higher because of higher wages in other industries. The machines and capital substituting for this labor have sometimes been expensive—but low in cost in relation to the labor they replace.

Substitutes For Land and Labor

The resources purchased and brought into agriculture that we've been talking about have served largely to substitute for both *land* and *labor* in farming. We can now produce our food needs with much less of both than at any time within the past 50 years. Estimates indicate that we could withdraw at least 40-60 million acres of cropland and still easily meet our food needs. Total farm employment already has declined by half in the last 30 years; by more than a third in the past 10.

These substitutions are possible because the nonfarm capital items used in much of today's farm technology replace land and labor in producing a given output. We can produce more with fewer laborers and with fewer acres of land by using these added and substitute resources.

Bags of fertilizer, cans of insecticide, etc., as well as machines and power units substitute for farm labor, freeing it and causing it to seek employment elsewhere. They make it possible to meet our food requirements with fewer acres—or to produce a surplus if we continue the same acreage in field crop production. We've tended to follow the latter course—keeping the land mostly in production and mopping up the surplus in government storage operations.

And with current domestic rates of demand and population increasing slower than the rate of our output increase, we're now faced with (1) stepping up the rate at which labor and land are withdrawn, (2) slowing down the rate at which substitute resources are injected into agriculture or (3) opening up new markets.

Why, in the face of our mounting surpluses and the national forces outlined last month, do farmers continue to buy and use these added or substituted resources? Mainly because it remains profitable for farm operators to do so in terms of the costs of the resources compared with the prices of the products produced. The cost-price relationships have been favorable—particularly for commodities that have had high price supports and also for some crops without supports.

Thus, the "HOW" of our rapidly increased agricultural productivity *is the rapid increase in the use and substitution of purchased and brought in resources.* The "WHY" *is that these resources have been priced favorably in relation to the prices of farm products produced with them*—low enough to encourage widespread adoption because of their profitable returns.

While a surplus output depresses both farm product prices and incomes, it hasn't put much of a damper on the use of these still profitable resources and practices that add to output. This is partly because of the competitive nature of farming and its millions of farm firms. One producer himself can't influence the market. If he merely cuts back his own output, he still gets only the going market price per unit and has less income and higher costs than before. But if he boosts his output, he still gets the going market price, and his income goes up—though he'd be even better off if agriculture in total weren't overproducing.

With continued ability to draw profitable resources from "outside itself", agriculture will have a surplus producing capacity for some time into the future. The current problem, and that of the next decade, will be to figure out how to manage this surplus capacity to avoid further depressed incomes and to balance this against the consequences of different courses of action or inaction.

As we mold farm policies and programs for the future, we must consider the forces mentioned in this article, the national forces outlined last month and the economic and social costs and consequences of the proposed solutions.

End.

PROGRESS REPORT

A SPECIAL REPORT ON NEW AGRICULTURAL CHEMICALS

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL CORPORATION
40 RECTOR STREET • NEW YORK 6, N. Y.

New PLYAC® Polyethylene Spreader-Sticker Increases Effectiveness of Insecticides, Fungicides, Herbicides

Made with emulsifiable polyethylene, Plyac Spreader-Sticker is a non-oil product in liquid form. It increases the effectiveness of virtually all insecticides, fungicides and herbicides. It can be added to wettable powder and emulsifiable concentrate and sprays. Only 2 to 4 ounces in each 100 gallons of spray mixture makes agricultural sprays stick better, spread better and last longer.

Only 2 to 4 ounces of Plyac spreader-sticker in 100 gallons of spray mixture makes agricultural chemicals stick better, spread better and last longer.

Summary of advantages

1. Plyac spreader-sticker makes sprays stick and gives better protection to crops, even in rainy weather when sprays without Plyac wash off easily.
2. Plyac spreader-sticker makes sprays last longer. It reduces the amount of re-spraying necessary.
3. Many products of limited solubility stay in suspension much longer when a little Plyac is added . . . making these products much easier to work with.

New UROX® non-crop Weed Killer Lasts as long as 8 to 18 Months . . . gives "clean-as-a-whistle" control

Urox is a highly potent non-selective type herbicide specially formulated for easy, economical use in non-crop areas where weeds are a maintenance problem, an eyesore or a fire hazard. Urox Weed Killer is available as a liquid or in single or double strength granular form. One application controls weeds for 8 to 18 months . . . destroys such hard-to-kill growth as bindweed, bouncing bet, Russian knapweed, Johnson grass and a wide range of similar annual and perennial grasses and broadleaved weeds. Urox also kills brambles, palmetto, lantana, sage brush and most other types of brush.

Summary of advantages

1. Urox Weed Killer tends to build up in soil. Its herbicidal action thus can be extended from one year to the next with light, booster doses.
2. Liquid Urox is ideal for spraying large, overgrown areas. It won't precipitate out in the tank . . . doesn't need continuous agitation . . . won't clog spray nozzles or strainers . . . can be mixed with fuel oil, diesel oil or ordinary weed oils.
3. Granular Urox Weed Killer is the convenient, inexpensive way to treat small weed-infested areas. It comes in two forms — Granular Urox 11 (11% strength) and Granular Urox 22 (22% strength) — for easy application with any mechanical or hand-operated spreader.

New KILMAG* larvacide gives nearly 100% control of fly maggots in droppings under poultry and mink cages

Kilmag is a calcium arsenate powder which has been used successfully to combat the most difficult problems on Florida and California Poultry farms—enabling poultrymen to reduce serious fly problems and to prevent the spread of infestations by disease-carrying houseflies. Mink farmers are also experiencing this same superior fly kill. Kilmag gives near-perfect control of both common housefly and soldier fly maggots . . . destroys even those flies resistant to chlorinated hydrocarbon and organo-phosphorus insecticides. Only 2 to 4 lbs. of Kilmag in 4 gals. of water will treat over 1000 square feet of droppings, using a coarse spray. Control is maintained by spraying every 7 days.

New URAB* Brush Killer penetrates soil to kill toughest broadleaved and evergreen brush

Urab Brush Killer, in granular or liquid forms, has the special attribute of penetrating soil — thus reaching deep roots to give thorough kill. Urab is effective against toughest brush . . . kills conifers at low rates per acre. Also kills scrub oak, wild hickory, sassafras, poison sumac and other weed trees; thistles, trumpet vine, briars, cattails and Canada thistle. Urab can be used for spot applications or sprayed over large overgrown areas. For spot applications, only a few tablespoons of Urab Liquid or a few ounces of Urab Granular will do the job!

Summary of Urab advantages

1. Once Urab Brush Killer is applied to soil, rain water carries it down into the root zone. Urab kills roots as it goes down and thus gives surer kill than less soluble weed killers which kill only top growth. Urab also defoliates trees quickly, especially conifers.
2. Urab is the most economical way to kill conifers and mixed stands of conifers and hardwoods.
3. Unlike some brush killers, Urab does not give off vapors damaging to crops.
4. Urab is so powerful that less material is required for effective control.
5. Urab is easy to apply. Less equipment is required than with many other brush killers. Workers can easily cover more ground.

Trademark of Allied Chemical Corporation

Summary of advantages

1. Kilmag can be used to treat poultry droppings under all caged birds . . . under slat or wire floors . . . in manure pits . . . under tier type roosts . . . wherever birds do not have access to droppings.
2. Kilmag is economical in cost and far cheaper than other available fly control materials. The cost of application is less than the cost of frequent manure removal.
3. Poultry droppings treated with Kilmag have their usual high fertilizing value. They can be used on all crops with established residues for the product.
4. Kilmag is safe to use when applied according to directions. There is no danger to the applicator or to poultry caged over manure.
5. Mink farmers can get the same superior control as poultry farmers.

Kilmag controls the larval (maggot) stage of houseflies and soldier flies in accumulations of droppings under caged birds on wire floors.

Trademark of Allied Chemical Corporation

GENITE® 923 MITICIDE destroys early mites on fruit trees controls mites on ornamentals and shade trees all season long

Genite (2, 4 dichlorophenyl benzene sulfonate) is a specific miticide for killing European red mite and clover mite (bryobia mite, brown almond mite). It is recommended for early season use on apple, peach, pear, plum, prune and almond trees. Ornamentals and shade trees can be sprayed with Genite anytime mites are a problem. Genite miticide is available in both 50% emulsifiable and 50% wettable powder forms for application with speed or hand sprayers. 1 to 1½ pints of 50% emulsifiable Genite or 1 to 1½ lbs. of Genite wettable powder are needed for each 100 gallons of water.

Just one spraying with Genite Miticide protects fruit trees against early mites far into summer.

Summary of advantages

1. Genite miticide kills mites and mites oly. This is an important property since most miticides in present use also kill beneficial insects which prey on mites — thereby perpetuating the mite problem.
2. Genite miticide gives excellent early season control of mites on fruit trees. A single application between delayed dormant and full bloom will control early mites into mid-summer, reducing the number of late season mite sprays needed.
3. Genite miticide can be used to control mites on ornamentals and shade trees anytime during the growing season.
4. Since Genite miticide is applied to fruit trees before fruit formation, it won't injure buds and eliminates the risk of excessive residues on fruit.
5. Genite miticide kills all stages of mites, including overwintering eggs. When Genite is used, mite population control has been extended even into the following year.

General Chemical TEDION gives long-lasting mite control

Tedion kills even resistant strains of Texas citrus mite and citrus red mite; control lasts for several months. Tedion is also effective against mites on pome and stone fruits, grapes, cotton, seed alfalfa and ornamentals. It is available in 3 forms — 25% wettable powder, emulsifiable with all common insecticides and require no special handling procedures or equipment. Tedion is relatively harmless to beneficial insects which prey on mites and has low toxicity to workers and warm blooded animals.

Summary of advantages

1. One application of Tedion controls mites and their eggs on citrus trees for several months. Less re-spray is needed.
2. Tedion added to cover sprays will control mites on apple and pear trees right up to harvest.
3. Early application of Tedion on cherry, peach, plum and prune trees will control mites, even after a majority of overwintering eggs have been hatched, right into summer.
4. A single application of Tedion effectively controls mites on seed alfalfa for several weeks.
5. Greenhouses achieve 6 to 10 weeks control of mites with a single application of Tedion.
6. Tedion's low residue level, established at 2 ppm, gives it a wide safety factor in dried citrus pulp used for cattle feed.

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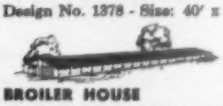

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AGRICULTURE IN AN UNEASY WORLD

Continued from page 28

face of the earth to be confronted with problems of continuing ample supplies of almost all kinds of food and fiber and I often think how much better off we are to be worrying about abundance than about scarcity.

Most of the serious policy problems about which there has been dispute have related to how our federal government can effectively and at reasonable cost, encourage and sustain farmers in their effort to produce ample supplies of food without depressing their own prices and thereby economically destroying themselves. Farmers are ever confronted by the so-called law of supply and demand. I use the world "law" with some hesitation because this "law" is more honored in its violations and manipulations by those who dominate many market places, than by its free application . . .

In my judgement, the broad agricultural policy of government has been constant since the days of Franklin Roosevelt. It is well stated in the opening paragraphs of the AAA legislation.

So, also, the farm problems which confront this government have not basically changed. They involve the distribution of our abundance, domestically and also throughout the world for the achievement of the ultimate objective of all mankind — namely, a peaceful world in which all men will have a reasonable opportunity to develop their intellectual and spiritual potentialities. We continue to fail in this responsibility, so long as our abundance remains unused or undevoted to this end.

Somehow this government has fallen far short, both on the domestic and world front, in applying this God-given abundance to the purpose and objective for which, in my humble judgment, He gave us the skills and resources to produce it.

It is the responsibility of the Secretary of Agriculture to so use the laws and resources at his disposal to make certain that there is always an ample supply of food on hand for our domestic needs, in peace and in emergencies, for our foreign trade and now for use in supporting the free people of the world in the contest with Communism for the minds of men.

If there was a major failure in the supply of food in this country, the economic impact would be almost immeasurable on every other industry and every individual. Perhaps a few of the farmers who were fortunate enough to produce a crop would temporarily benefit. But we know that even they would soon be confronted with price ceilings as was the case during and following World War II.

In addition, the Secretary of Agriculture is today charged with a greater responsibility to consumers than he has ever been heretofore.

It is impossible for consumers to reconcile ever mounting prices for their daily bread with the ever decreasing prices to the farmer who produces the essential ingredients of their daily bread. Above all, it is impossible for any of us to reconcile the 6 billion dollar annual cost of operating the Department of Agriculture the past few years, and its resultant tax burden with the negative results or absence of any benefits to both farmers and consumers.

These are the problems of the present and future Secretaries of Agriculture and I know we wish for them the strong supporting arm of providence in their search for solutions.

WICKARD: I am sure that there were literally millions of people who wondered why I acted like I did when I was Secretary of Agriculture. I do not doubt that many such people are in this audience today . . .

In my case I suspect that many wondered if I even knew what I was trying to do. Perhaps I should start by describing what I thought my job was. I thought my job, always within the policies of the President, was to advocate or undertake those measures which would, so far as possible, fill the nation's needs for food and fiber. Some of the President's policies were clear. Others were implied.

For example, if I thought additional funds were required, I could not ask the Congress to appropriate such funds until the Director of the Budget told me that the request was in keeping with the President's Program . . .

It is my belief that the most important task of the present Secretary and those to come later will be to do what they can to see that the Agricultural Revolution which was created by our advanced research, our ingenuity, our

(*Continued on page* 36)

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This 36-page pocket-size booklet from Pfister Associated Growers contains planting tips, corn population tables, picking tips, corn starvation symptoms, measurements and information on how to conduct an accurate yield check.

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Weed control in corn is a topic covered by a reprint from the February issue of Better Farming Methods available free to you from Geigy Agricultural Chemicals. These reprints, written by research authorities on weed control, are available in two areas. Order the one which is especially written for your section.

A — Weed Control in Midwestern Corn Crops.

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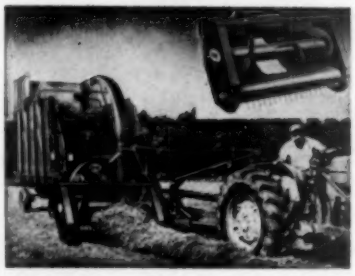

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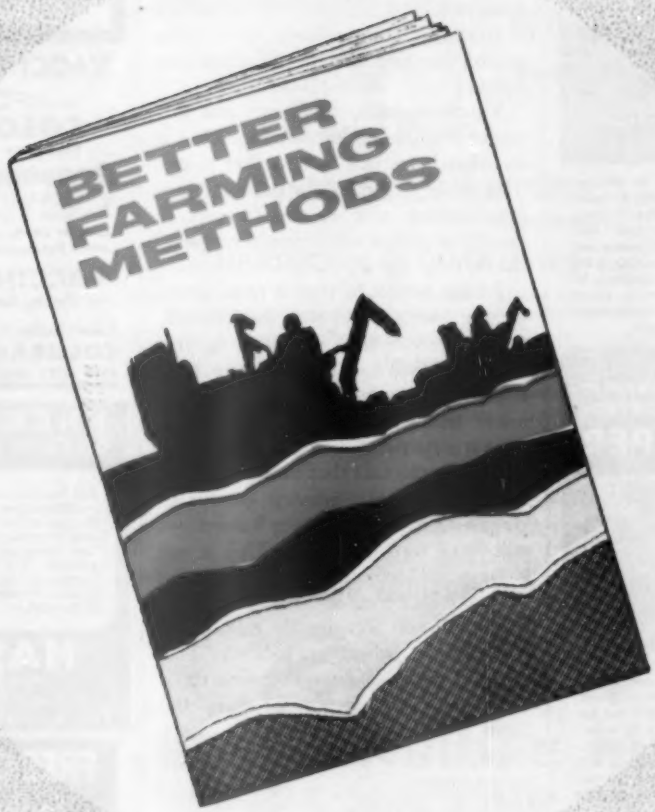

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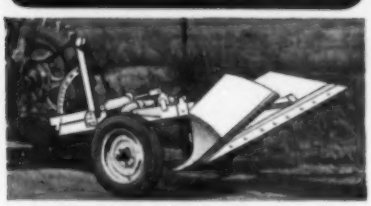

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UNEASY WORLD

continued from page 33

superior educational processes and our American system of farming, is not allowed to destroy these same forces which created it.

This can happen if American farmers are forced or even encouraged to continue producing for a market that does not exist.

Basically, the problem is to bring production and effective demand into balance . . .

Fundamentally, there are just two ways of reducing production. One is by what is termed free market prices. The other is through a national program which will enable farmers to make the proper adjustments cooperatively.

I have no doubt that if farm prices go low enough and stay low enough, that there will be a reduction in production. How low or how long I do not know — but apparently much lower and longer than we have previously experienced.

Despite the fact that in recent years, we have had the greatest exodus of people from the land ever known, we still have too many left. This is not a farm problem. It is just part of a national problem of finding productive work and security for millions of our citizens wherever located. This national problem is even more difficult and more important than the farm problem. It constitutes a sharp challenge to our economic and political systems.

To be successful in reducing production, the free price plan — the bankruptcy plan — must ultimately reduce the amount of land under cultivation, or the intensity of its cultivation, or both. I am convinced that this method is undesirable and potentially dangerous. The sensible thing is to use a government program to achieve the same result in an orderly manner. I refer to a land retirement program.

Such a program would reduce the wasting of human, soil, mineral and other important resources involved in producing for a market that does not exist. In fact, it would conserve our soil and water resources.

It would tend to shift much of our land now under cultivation to reforestation and to water shed cover to which it is better adapted. Such a program would promote the use of bet-

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ter farming methods rather than making their use impossible.

It would make it possible for rural communities to have better rather than poorer educational and training facilities for the youth in these areas.

It would make it possible for rural communities to continue to be a much needed economic, social and political stabilizing influence in our nation.

It would preserve rather than destroy the kind of farming system which has met the needs of the nation so well in the past and which is the best guarantee that such needs will be met in the future.

The chief responsibility of the Secretary of Agriculture is to give us the leadership which will help us achieve the results which I have just listed.

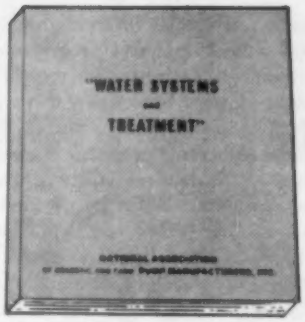
WALLACE: First I would say that every Secretary of Agriculture must have a fixed goal. In my case I wanted the farmers to get equality of bargaining power and parity of income while at the same time increase soil fertility and feed the people of the USA and the world more abundantly . . .

Of course every Secretary wants the conditions of living and the opportunities for education on the farm to improve. Therefore every Secretary wants greater security of tenure but no diminution in the speed of adopting modern technologies.

In 1933 when I became Secretary the situation was so desperate that the farm organizations, many insurance companies and even the U. S. Chamber of Commerce were behind me in getting action legislation from the Congress.

I had fought for the McNary Haugen Bill and its Equalization fee when my father was Secretary of Agriculture. Therefore, I was in close contact with farm organization leaders. These people looked on me as a special pleader for their cause. But I felt I had to be more than that.

Moreover I found what every Secretary of Agriculture knows, that I had to reckon with the Budget Bureau, with the Secretary of State, with the Secretary of Treasury, with the House and Senate Committees on Agriculture and the House and Senate subcommittees on agricultural appropriations. And above all there is the need for loyalty to the President's over-all program. A Secretary soon discovers that Senators and Congressmen often sympathize much more with



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Modern, profitable farming requires *more water* in *more places* —with higher capacity and higher pressure. You can rely on Rapidayton submersible pumps, quality-built to insure that extra heavy-duty performance and 24-hour-a-day dependability so vitally essential in a farm "lifeline." Ideal for pressure tank systems; free-flow irrigation and sprinklers; livestock watering, sanitation, and waste removal; fire protection. There's a Rapidayton submersible pump for *your* need. Write for folder on farm pumps.

Rapidayton division The Tait Manufacturing Company
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40 acres "GROW LIKE SIXTY" with Buckner Sprinklers

Up-date irrigation with a Buckner sprinkler system and watch your crop yields grow. Buckner sprinklers eliminate production robbing short droughts, "hot spots," and give you the best **effective** water coverage pattern money can buy.

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P. O. Box 232, Fresno 8, California
World Wide Distribution

KEEP 'EM MILKING
SORE TEATS
SCAB TEATS
BRUISED TEATS

This **2-way action** keeps teat OPEN ...speeds HEALING

Dr. Naylor Dilators promote natural milking and normal healing because they ACT TWO WAYS:

1. ACT MECHANICALLY — keeps end of teat open to maintain free milk flow. Stays in large or small teats.

2. ACT MEDICALLY — Sulfathiazole *in* the Dilator is released *in* the teat for prolonged antiseptic action—directly at site of trouble.

At drug and farm stores or write:
H. W. NAYLOR CO.
Morris 7, N.Y.
Large Pkg.-$1.00
Trial Pkg.-50¢

Dr. Naylor's MEDICATED Teat Dilators

high pressure, special interest groups, than with the President's program as set forth in either legislative requests or budget askings. Sometimes there is discord even in the Cabinet family.

The cross currents probably put the Secretary of Agriculture in more uncomfortable and difficult positions than any other cabinet officer. He must balance off a large number of conflicting forces. He usually ends up by pleasing no one completely . . .

Looking ahead 10 years I feel that all Secretaries of Agriculture will have to recognize that government is in the agricultural business to stay.

I do not like it. Farmers do not like it. **But how are farmers to get equality of bargaining power without help from the government? The bargaining power of both corporations and labor comes largely from government. If minimum wages are guaranteed, farmers will insist on minimum prices. They will never get parity of income as defined during the campaign. If they could be sure of half that amount year in and year out they would be lucky.**

As long as there are subsidies direct or indirect either of power or money to non-farm groups, farmers will want their equalizer.

There will be many conflicts as many selfish interests collide. In 1935 we tried to reconcile these conflicts county by county, state by state, and region by region. That might be well done again against the background of 1961 realities

It is quite possible that philosophers and historians at the end of the year 1999 looking back over the Twentieth Century as they prepare to greet the Twenty-First Century will say:

"The U. S. A. failed because she failed to understand the earth-shaking potentialities in the nationalistic aspirations of the people in the crowded, under-developed areas. She could have used her agricultural surplus and agricultural technology to have prevented much of that destructive violence which has stained the last four decades of the most bloody century in all history. She did not bring together the best brains to meet that problem and act accordingly."

The statesmanship of the Secretaries of Agriculture and State during the next three administrations will largely determine whether or not this judgement of doom will be passed upon our beloved country.

End.

More Profits with Market Topping HAMPSHIRES

✔Better Mothers ✔Cheaper Gains ✔MORE Meat

Raise Hampshires to get that extra pig per litter; more pounds of consumer approved red meat per head; and higher dollar value of carcass. Profit by maximum prolificacy, motherly instinct, rapid growth, economy of gain, foraging ability, and well muscled carcass quality. Count the belts on farms and markets for proof of farmer preference. Hampshires consistently weigh, grade and cut better than estimated. You can buy Hampshires that are Certified as superior meat hogs. Write for literature about this leading breed and its Certified Meat Hog Program.

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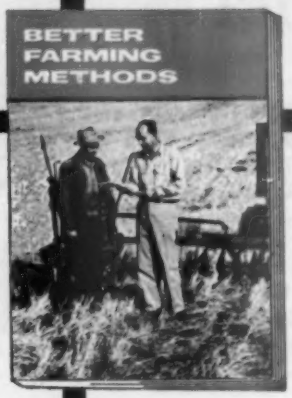
Industry has its Change-Agents, too



BETTER FARMING METHODS is a Change-Agent in the magazine field. Its recent innovations in editorial content and direction have made BFM unique in agricultural publishing. We believe these same changes make it of greater service and value to you, its readers.

You are a Change-Agent -- selected on the basis of your local influence on agriculture. Your enthusiastic approval has endorsed BFM's new concept and it now reaches a greater audience than ever before.

Industry has its Change-Agents, too -- commercial companies who are alert to new opportunities and aggressive in taking advantage of them. BETTER FARMING METHODS provides a new avenue in marketing farm products. Here are some of the new advertisers who, along with their agencies, are providing up-to-date information for BFM's Change-Agent audience.

Armco Steel Corp. - (Marsteller, Rickard, Gebhardt and Reed, Inc.)
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National Cooperatives, Inc. - (Sherman Peterson & Assoc.)
Smith-Douglass Co., Inc. - (Chesapeake Advertising, Inc.)
Standard Oil (Indiana) - (D'Arcy Advertising Co.)

A number of other companies are maintaining or increasing their advertising schedules in recognition of BFM's value as a marketing tool.

BFM's Change-Agent audience -- 50,000 strong -- will continue to set the pace in a changing Agriculture, served by this combination of unique editorial content and up-to-date product information.

BETTER FARMING METHODS

Specialized Magazine for Agricultural "CHANGE-AGENTS"

Watt Publishing Co. **Mount Morris, Ill.**

Are you getting your money's worth from your Feed Dealer?

HAS HE KEPT PACE WITH YOUR CHANGING NEEDS? The Master Mix dealer and his employees pride themselves on keeping abreast of the times. They are participants in a continuous Master Mix training program. This program keeps them up to date on new feeding and management developments . . . equips them with new and better ways to serve you.

IS HE SOMEONE YOU LIKE TO DO BUSINESS WITH? The Master Mix dealer is friendly, enthusiastic and takes a sincere interest in your farm business. He boosts agriculture in his area . . . and takes an active interest in community affairs. He is a person in whom you can place complete confidence.

DOES HIS FEED PRODUCE THE MOST PROFITABLE RESULTS FOR YOU? Master Mix feed and feeding programs are the most efficient available! They are scientifically formulated and farm proven. You can rely on quality Master Mix feeds to give you the most for your feed dollar!

DOES HE SUPPLY THE INFORMATION YOU WANT AND NEED? The Master Mix dealer is a source of reliable and helpful information. Aided by the new Master Mix service, Market Radar, he can keep you supplied with advance information on market trends. He also has at his fingertips the knowledge and experience of a complete staff of Master Mix research and management specialists.

DOES HE SUPPLY THE SERVICES YOU WANT AND NEED? The Master Mix dealer has the equipment needed to best serve the farmer in his area; this may include grinding and mixing, bulk delivery, grain banks. He is geared to provide fast, efficient service.

CAN HE OFFER MARKETING RECOMMENDATIONS AND PLANS? The Master Mix dealer knows the local poultry and livestock markets and has a good working relationship with them. With the aid of Master Mix Market Specialists he can assist you in selecting the one best suited to your operation.

HOW ABOUT CREDIT? The Master Mix dealer has a sound credit policy. He is more than willing to sit down and discuss your needs.

If you would like an illustrated booklet discussing "ARE YOU GETTING YOUR MONEY'S WORTH FROM YOUR FEED DEALER?" please write Dept. SA

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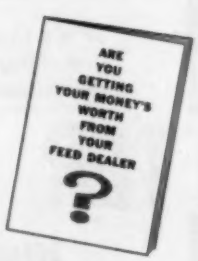
McMillen Feed Division
Fort Wayne, Indiana



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RESEARCH REPORT

A special report for leaders in our food and fiber industry. Complete publications available from noted source.

by R. L. Kohls, Purdue University

Meet the author of Agribusiness Research Report, R. L. Kohls, Professor, Agricultural Economics, Purdue University. Each month he will review late research bulletins on "non-production" topics in agriculture. Professor Kohls has been on the Purdue staff since 1948, doing both teaching and research. Prior to that he was instructor in Agricultural Prices at the University of Missouri. He is author of the book, *Marketing of Agricultural Products* (Macmillan), and has written many articles and bulletins on agricultural marketing and prices. He is also a member of Advisory Committee to the USDA on economic research.

Foreign Agricultural Production Soars

With all the emphasis on the need to increase our agricultural exports, it is necessary to keep our feet planted in reality. A recent report, **World Agricultural Situation, 1961** (*Office of Information, USDA, Washington, D. C.*) estimates world output of agricultural products is at an all time high. Total world output has increased 42 percent above pre-World War II levels. This increase has outpaced population growth—per capita output is up 6 percent for the same period. The report predicts that output will continue to outpace population during the 1960's.

Egg Products Industry Analyzed

Sometimes a new agricultural industry slips into the scene, grows and develops quietly, and then rather suddenly it is recognized as being a major and important factor.

Such is the case of the egg products industry of the U. S. The historical development of this industry from its beginning up to the current time is the subject of an analytical study, **The Egg Products Industry of the United States** (*Kansas Experiment Station Bulletin* 423, *Manhattan, Kansas*).

For those concerned with the impact of government, research, automation and technological changes on business operations this analysis is fruitful reading.

Chain Store Buying Affects Market Practices

Many involved with food production and distribution have become concerned that current marketing changes may weaken bargaining power and bring pricing troubles for farmers. A recent study, **Chainstore Merchandising and Procurement Practices** (*Marketing Research Report* 417, *Office of Information, USDA, Washington, D. C.*) suggests that these fears may have some foundation.

Chain stores have been a factor in fostering more direct shipping-point buying for fruits and vegetables and therefore have contributed to the decline of the terminal market.

Here in a few pages is a good descriptive picture of recent food retailing developments and practices.

You always get your money's worth from your Master Mix Dealer!

Central Soya
McMillen Feed Division
Fort Wayne, Indiana

EDITORIAL

by Frank Waddle

GET BIGGER OR GET OUT?

Get bigger or get out!

These are the words often used to describe the situation in farming today. This slogan is now backed by figures from the 1959 census of agriculture.

More farmers decided to get out during the five years 1954-1959 than during any previous five years in the history of the census. And, those that stayed kept getting bigger. The average farm in 1959 was 302.4 acres — up from 242.2 acres in 1954.

These are the facts. The question is: "Why are farms getting larger and what does this mean for the future?"

This question is hard to answer in a few words, but here's an attempt: Farms are getting larger because consumers — in a growing economy — bid up the price of things a farmer must buy, and advancing technology — creating surpluses — pushes down the prices of things a farmer has to sell. Thus, the only solution available to the individual farmer is to reduce his costs per unit of output and this means, among other things, expanding the size of his operation.

Others Had Problems

Now for the second part of this question: "What does this expanding farm size mean tc the future of agriculture?"

This one is more difficult because we must find the answer in the future and not in the past. This involves some guesswork and any proposed answer is likely to be wrong.

First of all, farmers aren't the only ones who have faced this problem. Actually, farmers are just beginning to feel the pinch that brought corporations to our industrial society a century ago. The problems of farmers in 1961 are very similar to those facing factory owners who saw the "machine process" gradually move production from the home into the factory. Larger machines required more capital and larger factories. Markets broadened. Demand for uniformity developed. Soon business was on a scale too vast for individual family ownership of the business.

Isn't the same thing happening in farming? We have the "machine process." Chain stores have created the broad market with a demand for uniform products. And farms may soon become too big for one family to own them. Some economists predict that the investment required for a farm of profitable size may soon grow as large as one-fourth to one-half million dollars.

What then?

Peter Dorner, Professor, Agricultural Economics, University of Wisconsin, proposes a modification of the corporate form to meet the needs of agriculture. Dorner suggests the construction of a market for corporate stocks to be managed and operated by a new governmental agency, stocks to be managed and operated by one or several families. One possibility is setting up a new government agency to purchase these stocks. Another possibility: Modify the Federal Land Banks so they could purchase stocks.

Existence of this system would give the farmer the option of inviting or selling his interest in a farm. The advantage of this proposal is the transfer of large amounts of capital to several heirs. Since the physical property could not be divided, issuing of shares would permit smooth and equitable transfer. The holder of such stock would have a ready market and the corporation could obtain credit more easily than could a farmer with a traditional mortgage.

What this actually amounts to is an improvement in the farm credit system — a need recognized by everyone. It is an adaptation of a method applied for many years in the industrial sector.

Dorner goes on to suggest that a change in the organizational structure, such as he suggested, may be the only solution to the present price-income problem in agriculture. He's merely suggesting that the best way to tackle this problem may not be directly — by supporting prices, controlling production, etc. — but by the indirect route of making it possible for farmers to meet the needs of the future in a manner similar to that of business.

Possibly we should give his proposal more consideration.

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"What went wrong? I followed the best advice that money can buy . . . I planted in the dark of the moon like the fortune teller at the county fair said . . ."

1 injection of Rubrafer® SQUIBB

(Squibb Iron-B_{12} for Subcutaneous Injection)

boosts hog profits 3 ways

...prevents pig anemia...speeds weight gains. Time-saving leg injection beneath skin means *no iron stains in ham*.

1. RUBRAFER BUILDS RICH RED BLOOD. Each dose contains 100 mg. of elemental iron, *more than enough* to prevent anemia—the #1 killer of baby pigs. Sow's milk supplies only 1/7 of a piglet's daily iron requirement. Unless piglets get extra iron fast, they get anemia. Many die quickly or become permanently sickly and unthrifty. A single injection of Rubrafer prevents growth set-back, gets pigs off to a healthy vigorous start in life.

2. RUBRAFER GETS PIGS TO MARKET up to 3 WEEKS FASTER. Each dose contains 80 mcg. of vitamin B_{12}—*more than enough* to help pigs put on extra weight fast. Rubrafer-treated pigs gain up to .32 lb. more per day than untreated pigs... gained up to .11 lb. more per day when tested against pigs treated with an iron-dextran type product, or 4.1 lbs. more after 4-5 weeks.

3. NO DAMAGE TO HAM WITH RUBRAFER. Rubrafer is injected beneath the skin behind foreleg or in front of hindleg. Unlike products that must be injected into buttocks, Rubrafer can never stain or damage the valuable ham. Special trigger-action Vet-Jecta® gun injects 12 pigs without reloading. No hard-to-use glass syringe, no pre-setting, no chance for error.

FREE BOOKLET
gives full details about pig anemia how to boost hog profits with RUBRAFER. Mail coupon today.

HALF-PRICE OFFER ON TRIGGER-ACTION VET-JECTA® GUN
that injects 12 pigs without reloading. Ask your dealer for details—save 50% over regular price.

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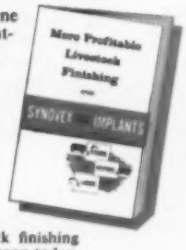
Natural hormone implants dramatically improve rate of gain and feed conversion. No hormone residues in meat.



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Gargon®

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Control all 9 types of mastitis germs, even hard-to-kill strains of staphylococci. No antibiotic or sulfa residues after 72-hour withholding period.

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tells how to prevent and treat mastitis. Mail coupon today.

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KING CORN'S 1960 TRIUMPH

All-Time Record Yield After A Late Spring Season

***All yields were made on Selected 5-Acre DeKalb Contest Plots.**

4,352,668,000 BUSHELS!

Corn's remarkable 1960 performance guarantees its continuing tenure as the "King" of America's field crops. Never before so many bushels--and after excessive Spring rains caused many planting delays. But America's corn crop came through with a spectacular 4,352,668,000 bushel harvest, (USDA estimate). No greater tribute to farm progress than this--a magnificent production record made by America's farmers. On this page are reported some of the excellent records* made by DeKalb Corn growers competing in the 1960 National Selected 5-Acre DeKalb Corn Growing Contest.

119.30 BU.* DEKALB CONTEST AVERAGE

That's a great average--any year. And, when you consider 1960's unfavorable planting start, such a yield average* is tremendous. Remember, too, that this 119.30 DeKalb bushel average* was made by 4454 contestants, producing under wide variations of soil, management and weather of 27 states and Canada.

WINNER FROM BLUE GRASS STATE

Kentuckian Charles Werline is the 1960 National DeKalb Champion with a yield of 217.76 bu. per acre*. He farms 240 acres in Lewis County, far Northeast in the State. He drilled DeKalb 805 in 40 inch rows May 20; planting DeKalb for the 20th consecutive year!

A HALF-BUSHEL* DIFFERENCE

Across the Ohio River at Washington C. H. in the Buckeye State, James R. Pierson harvested 217.29 bushels* to become National Reserve 1960 DeKalb Champ in the Contest--only .47 bushels* behind the winner! He drilled two DeKalb varieties on his 735 acre hog, cattle, sheep farm. Third honors go to Wm. Carney, Dansville, New York, on his yield of 206.17 bushels* One-fifth of a bushel per acre* separates third and fourth places: D. W. Tarter, Linden, Indiana, harvested 204.46 bushels per acre* and A. B. & T. Pitcher, Fort Collins, Colorado, made 204.25 bushels* on irrigated land--only 1/5 of a bushel* less! Consistent, high DeKalb yields!

CHAMPIONSHIP

For 21 consecutive years, more than two decades, more farmers have planted DeKalb than any other corn. That's the championship endorsement corn growers give DeKalb. They know it yields; they choose it over all others, year after year.

THE REASON--RESEARCH

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DEKALB AGRICULTURAL ASSOCIATION, INC., DEKALB, ILLINOIS

Commercial Producers and Distributors of DeKalb Seed Corn, DeKalb Chix and DeKalb Hybrid Sorghum

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